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A. M. A. SESSION CLEVELAND JUNE 2-6, 1941

This Time—TWO Symposia

Yes, there are *TWO Symposia* in the September (Boston) Number of the *Medical Clinics of North America—Two Symposia* that are of special importance to the Family Physician because they deal comprehensively with problems of great frequency in general practice. The first is on *"Cardiovascular Diseases"*—the second on *"Diagnostic Hints."*

In the *Symposium on "Cardiovascular Diseases"* you will find covered such subjects as Symptoms of Heart Disease and Their Interpretation; Electrocardiography and the General Practitioner; Curable Heart Disease and others. The *Symposium on "Diagnostic Hints"* includes important clinics on Differential Diagnosis and Treatment of Acute Diseases of Digestive System; Differential Diagnosis of Acute Diseases of Respiratory System; Diagnosis and Treatment of Blood Disorders in General Practice; Differential Diagnosis of Common Infectious Diseases, and seven other Clinics.

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THE TREATMENT OF ARTERIOSCLEROSIS OBLITERANS

SOCIAL SIGNIFICANCE AND ULTIMATE OBJECTIVE

CHAIRMAN'S ADDRESS

IRVING S. WRIGHT, M.D.

NEW YORK

The problems presented by the development of arteriosclerosis are of overwhelming magnitude both medically and socially. Their potential significance is, nevertheless, for the most part hopelessly underestimated. Yet, unless satisfactory solutions are found for the varied facets of this massive loadstone, it may prove too heavy for our present civilization.

Once before when our civilization was threatened by the weight of a great problem, a then little known man, Abraham Lincoln, suggested a mental approach which appears equally applicable to the present: "If we could first know where we are and whither we are tending, we could better judge what to do and how to do it."

For centuries men have sought the secret of longevity. The alchemists, soothsayers and astrologers flourished in the courts of many dynasties that they might prolong the lives of the rulers. The search for this secret drove men such as Ponce de Leon to the ends of the earth, to no avail.

The average span of life still remained under 40 years, although a certain percentage of the population did manage to achieve longevity. During the nineteenth century, however, in many laboratories, scientists were quietly bringing to light facts which within three short generations have markedly changed this situation. Pasteur, Koch, Semmelweis—their names are almost legion—made possible the tremendous saving of infant life; the practical elimination of many of the worst scourges from the modern nations, such as yellow fever, cholera and bubonic plague; the marked reduction in death from infectious and contagious diseases, such as pneumonia, tuberculosis and diphtheria, and a much better understanding of proper hygiene and nutrition. It has been with just pride that the medical and public health workers have pointed to the reduced mortality and morbidity rates of the population and to the fact that no group of people of equivalent size has ever achieved the health record enjoyed by the citizens of the United States. Except for a few students of trends, however, the ultimate effects of this change have not been forseen too clearly or with sufficient analytic acumen. True, it is recognized that in 1850 the average length of life was 42 years, whereas it is now more than 60 years. In this country there has been an increase of nearly 20 million persons in the age groups over 50 years. All of these are potential victims of arteriosclerosis unless some other disease factor produces death first. Over the age of 65 the senescent vascular changes become increasingly frequent and serious whether they affect the brain, heart, kidneys, extremities or some less vital tissues. Incapacity is usually prolonged, often lasting years, yet demanding the most exacting medical care. It is estimated that in 1980 the number of persons over 65 will be double that of today. Such predictions are not, however, always accurate. *Blackwood's Magazine* predicted in 1860 that the population of the United States in 1940 would be 303,000,000.

It is obvious that, now that the long sought for lengthening of life is available for a much larger portion of the population, it comes as a mixed blessing for which careful planning is required.

Neither the economic nor the medical aspects of this situation appear susceptible of solution in the light of our present knowledge. Prolonged and detailed experimental studies and careful critical analyses will be necessary before an intelligent approach can be attempted.

While the facets include economic, sociologic, psychiatric and other phases, this presentation must of necessity deal more directly with the medical aspects of the situation. I will therefore examine some of the facts in this regard. While the earliest evidences of arteriosclerosis are known to occur under the age of 40 there are definite degenerative changes present somewhere in the arterial trees of practically all individuals over the age of 50. All blood vessels regardless of what tissues or organs they may supply should be considered a part of the peripheral circulatory system. This conception is vital for the understanding of the problem, clearly pointing out the serious prognostic significance of one arteriosclerotic crisis for any or all other arteries and arterioles in the body of the individual. Since each decade is producing approximately half a million additional candidates for these complications, the potential problem is increasing at a serious rate.

CORRECT DIAGNOSIS

An important step toward clarifying the picture, therefore, could be achieved by a reclassification of this pathologic condition in mortality and morbidity tables. Thus, for accuracy, conditions should, when correct, be diagnosed:

Arteriosclerosis with secondary diabetes mellitus instead of diabetes mellitus with arteriosclerosis.

Arteriosclerosis of the cerebral vessels with thrombosis or hemorrhage rather than apoplexy.

Arteriosclerosis of the renal vessels rather than Bright's disease or chronic nephritis, or arteriosclerosis of the vessels of the legs instead of senile or diabetic gangrene.

If this principle were applied to the classification of the process in all organs including the coronary arteries

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of the heart, the statistics would then be properly weighted and the tremendous significance of this trend would at once be obvious to all. It would be more widely recognized that of the proportion of the population over 50 years of age 60 per cent (15 million) will die of some cardiovascular-renal syndrome whereas only 9 per cent will die of cancer. A very large but as yet undetermined portion of that 60 per cent will die as a result of degenerative changes of the arteries with the cardiac, renal or other syndromes merely the results of secondary ischemia or hemorrhage.

As these syndromes frequently produce prolonged and painful disability before death, a change in philosophical approach might well be considered. Perhaps the mere prolongation of life should no longer be sought as the highest goal but rather longevity only to such a degree as it is compatible with happiness and a full life free from pain and invalidism.

It is necessary to understand the mechanisms involved before we can hope to solve the enigma of arteriosclerosis. The gaps in our knowledge are formidable. We do not know for a certainty whether this condition should be correctly classified as a disease or a degenerative process, although more recently the trend has been toward the latter designation. It is not impossible, however, that further investigation may reverse this trend.

We do not know what causes this process to take place. The etiologic factors which have been the subject of study are many, including age, diet, physical work, worry, climate and infections, yet definite proof is lacking which would make it possible to state that arteriosclerosis is a direct result of any one of these factors.

We do not completely understand the biologic phenomena by which these changes take place. Whereas arteriosclerosis can be readily produced by the feeding of cholesterol to rabbits and this can be prevented by iodides, thyroid extract, pancreatic tissue extracts and other substances, the difference in the metabolism of the herbiverous rabbit and man as regards cholesterol does not justify direct inferential conclusions.

Winternitz and his co-workers have shed interesting light on the possibility of the development of arteriosclerotic plaques from hemorrhages of the vasa vasorum. The importance of this factor has been disputed by others. Certain authors have advocated theories of direct stress and strain, dehydration, heredity, endocrine changes, vitamin deficiencies and other possibilities. Perhaps each of these factors has certain importance but we are still at a loss as to why one man develops generalized arteriosclerosis at 35 years of age with no apparent cause, whereas another man escapes equivalent involvement until he is 65. It seems likely that the incidence of sclerosis in general increases with age because of the accumulation of traumas, namely the aforementioned etiologic possibilities, during the passage of years. These factors may not, however, operate in the instance of a specific individual.

THERAPY

In spite of this situation, important contributions have been made toward the physiology and pharmacology of the normal and impaired circulation. The scope of this presentation does not permit a review of the voluminous literature on this subject. A valuable symposium appeared in the February issue of the *Archives of Surgery*. Certain principles of therapy have been evolved as a result of the combined efforts of many workers which have favorably influenced the outlook of the individual with arteriosclerosis obliterans. It is difficult to determine at this time whether the average longevity is actually increased by these methods. Whereas in one individual the control of infection with healing of a gangrenous foot may definitely prolong his life, another patient may die earlier because his intermittent claudication distance was markedly prolonged by treatment, thus producing an increasing strain on a damaged heart with a resulting failure. I have seen what appeared to be striking examples of each of these groups. One common objective was achieved in each group, a more satisfactory life. In the first instance the gangrene was healed and the patient restored to a life of activity and freedom from pain. The second patient, who had been enabled to walk but half a block and hence could scarcely be classified as more than a semi-invalid, became able to walk from six to eight blocks, returned to business and regained his interest in life and finally increased his walking to a greater extent. After playing nine holes of golf he suddenly developed an acute decompensation, probably associated with a coronary occlusion, and died. It is not certain but seems probable that his life of semi-invalidism might have been of longer duration. The choice of the majority of the patients with whom I have frankly discussed this elective has unhesitatingly been for the fuller if shorter life.

The trend in recent years has been toward conservative therapy as against radical surgery. Marked success has resulted from this trend in the treatment of the organic occlusive disease thrombo-angiitis obliterans. The major amputation rate, which formerly averaged about 70 per cent, is now averaging from 3 to 10 per cent in several leading vascular clinics. Arteriosclerosis obliterans has been less responsive to conservative therapy for numerous reasons, a few of which follow:

1. We are dealing with older tissues with less resistance to infection and less capacity for regrowth.
2. A large percentage of these patients are seriously handicapped by diabetes mellitus, arteriosclerotic renal disease, heart disease or other complications.
3. The point of blockage in arteriosclerosis obliterans is frequently, though not always, quite far proximal, thus blocking a large arterial trunk and reducing the possibilities for collateral circulation, whereas characteristically thrombo-angiitis obliterans begins by involving the minute distal vessels, very slowly extending proximally, giving the collateral vessels a better opportunity to establish their functional capacity to the ischemic tissues in response to metabolic demands.
4. Spasm plays a less important part in arteriosclerosis obliterans than in thrombo-angiitis obliterans, and hence therapy directed at the production of vasodilatation is, as would be expected, less effectual.

In spite of these handicaps, definite improvement in the amputation rate has been achieved by the selective and considered use of the following important technics and medications:

1. Rest of the involved extremities in a controlled temperature of from 88 to 94 F.
2. Soaks and baths at similar temperatures, using only mild solutions such as saline, boric acid or azochloramide in triacetin 1:500.
3. Heat applied to the abdomen, producing reflex vasodilatation.
4. Postural exercises, preferably passive, by means of the oscillating bed described by Sanders.
5. Pressure-suction boots in a few selected cases.
6. Alcohol in the form of spirituous liquors by mouth.

7. Deproteinated and other pancreatic tissue extracts by intramuscular injections.
8. Extreme general care in the protection of the feet.
9. Meticulous attention to any open lesions, using only correct technic in their care.
10. Control of diabetes or other complications.
11. The judicious use of the sulfanilamide compounds in the presence of infections, selection being based on the organism present, if possible.

Of almost equal importance is the necessity of avoiding:

1. The use of tobacco.
2. The use of heat greater than 96 F., applied to the extremities—especially in the form of hot water bottles, heat pads, infra-red, diathermy and short wave machines.
3. The use of strong antiseptics.
4. Meddlesome surgery in unskilled hands.

Of probable or possible value in the treatment of other vascular diseases, but of questionable value in the treatment of arteriosclerosis obliterans, in my experience are:

1. Typhoid vaccine.
2. Saline or other solutions intravenously.
3. Intermittent venous hyperemia.
4. Mecholyl iontophoresis.
5. Sympathetic surgery.
6. Vasodilating drugs, nitrites and theobromine compounds.
7. Papaverine, except for its opiate effect.

Certain points should be carefully considered before amputation of an extremity is decided on:

1. The extent and spread of infection of the local lesion. Rapidly spreading highly infected gangrenous areas sometimes demand amputation to prevent septic death. These are now subject to better control with the use of the sulfanilamide group.
2. The level of blockage of the major arterial trunk of the affected extremity, the amount of compensatory reserve and the collateral vessels active. These facts can be ascertained by the use of the oscillometer, thermocouple readings with vasodilator tests, arteriographic studies, ergometric tests, histamine flare tests and other methods. Amputation should be high enough to avoid the need for secondary surgery.
3. The status of the remainder of the peripheral circulation. This is particularly important when one leg is involved. Examination frequently reveals that the circulation is actually poorer in the opposite leg, but, having escaped trauma, no open lesion has as yet appeared. Amputation of one leg in these cases is not infrequently followed shortly by the need for repetition in the second leg. It is therefore of vital importance to be conservative if possible in such a case.
4. The age and general condition of the patient. It should be remembered that about 50 per cent of arteriosclerotic patients fail to learn to walk on an artificial limb after a midthigh amputation and that such a patient cannot usually be said to be living a full or useful life. Diabetes, when present, seriously complicates the entire picture, whether one wishes to be conservative or radical.

While it is easier to study the circulation of the extremities, information thus obtained may help to understand similar processes occurring in less accessible blood vessels.

A PROBLEM OF UNRECOGNIZED SIGNIFICANCE

The vastest of all medical problems of the future, arteriosclerosis, it remains the most neglected. The medical schools for the most part give wofully inadequate training in its study and care. Too frequently the practicing physician fails to recognize its manifestations until gangrene has occurred. The public cares little for what it considers the vagaries of old age, although all who achieve old age are liable to them. The foundations have failed to recognize its importance and have with few exceptions, notably the Josiah Macy Jr. Foundation, concentrated on more spectacular diseases of lesser fundamental importance to our civilization. Too few research workers have engaged in its study, to a large extent because of lack of endowment. Truly, it has been a neglected field in proportion to its importance.

Here is a great opportunity for young men entering into the field of medicine for clinical and animal research. This presentation may be regarded as a challenge to them to determine the ultimate objectives in the field of geriatrics.

Man has the unhappy faculty of producing mechanical and biologic frankensteins without developing properly balanced factors with which to exercise suitable control. Witness the present world conflicts, technologic unemployment and this problem of how to handle the aged. The question may well be raised as to whether we should justifiably bend our efforts toward the further prolongation of life unless we are prepared to insure that increasing age will bring happiness to the individual and avoid unbearable hardship on the community.

400 Madison Avenue.

STUDIES ON PRESERVED HUMAN BLOOD

VI. REACTIONS FROM TRANSFUSION

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AND
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When considering the use of preserved blood, the clinician is confronted with two fundamental questions: 1. Is the administration of preserved blood efficacious? 2. Is the transfusion of stored blood safe? This report is an attempt to answer the latter question by a study of the incidence of reactions occurring in 2,423 blood transfusions.

The first transfusions of preserved blood were administered by Robertson,[1] working in the casualty clearing stations of the British army in 1917-1918. Utilizing the blood-dextrose-citrate mixture developed by Rous and Turner,[2] he gave twenty-two transfusions. A slight chill in one recipient was the only complication. With the recent development of blood banks in the United States has come the opportunity of studying the incidence of reactions in large series of transfusions. Belk, Henry and Rosenstein[3] reported jaundice or hemoglobinuria as a complication in seven of 400 transfusions. The incidence of chills, fever and urticaria was 10 per cent. In a series of 220 transfusions, Vary and Krahl[4] had an incidence of definite reactions of all types of 7 per cent and total possible reactions of 13

From the Department of Internal Medicine, State University of Iowa College of Medicine.

Read before the Section on Pathology and Physiology at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

1. Robertson, O. H.: Transfusion with Preserved Red Blood Cells, Brit. M. J. **1**: 691-695 (June 22) 1918.
2. Rous, Peyton, and Turner, J. R.: The Preservation of Living Red Blood Cells in Vitro: I. Methods of Preservation, J. Exper. Med. **23**: 219-237 (Feb.) 1916.
3. Belk, W. P.; Henry, N. W., and Rosenstein, Florence: Observations on Human Blood Stored at 4 to 6 Degrees Centigrade, Am. J. M. Sc. **198**: 631-633 (Nov.) 1939.
4. Vary, E. P., and Krahl, J. B.: Stored Blood Transfusion in a Relatively Small General Hospital, J. Michigan M. Soc. **38**: 1072 (Dec.) 1939.

per cent. In 1,415 transfusions, Diggs and Keith [5] reported reactions occurring in 6.7 per cent of the series.

The bases of the present report are the observations on a series of 2,423 blood transfusions, in 295 of which fresh blood was employed. The remaining 2,128 utilized blood stored from one to thirty-eight days at 3-5 C. Two types of preservative were used. The blood-citrate mixture comprised 500 cc. of blood plus from 50 to 100 cc. of 3.2 per cent sodium citrate in distilled water. This blood was regularly discarded after ten days of storage because of extensive hemolysis. The blood-dextrose-citrate mixture consisted of 500 cc. of blood, 650 cc. of 5.4 per cent dextrose in water and 100 cc. of 3.2 per cent sodium citrate in water. This is a modification of the Rous-Turner solution and has been described elsewhere.[6] Blood preserved in this solution was used for transfusions when over thirty days old. All the blood was collected by members of a team working in the Blood Transfusion Laboratory of the University Hospitals. Most of the donors were relatives or friends of patients. They were of both sexes and between the ages of 18 and 60 years. The blood typing and cross-matching were performed exclusively by technicians in the laboratory. The transfusions were administered by the interns attending the recipients. The blood mixture was allowed to flow into the vein by gravity through a 20 gage needle. No attempt was made to warm the refrigerated blood before administration. We have shown previously [7] that this is a safe procedure.

Whenever practical, the urine of the patient was made alkaline before transfusion by the oral administration of sodium bicarbonate in the hope of preventing anuria, should hemoglobinuria occur.[8] With the exception of a few instances, the group of the transfused blood was the same as that of the recipient. Within twenty-four hours after the transfusion a member of the team visited the recipient, inspected the clinical record and personally analyzed for hemoglobin the urine passed since transfusion. Tests for blood compatibility were repeated in many instances when chills and fever occurred.

TABLE 1.—*Incidence of Reactions from Transfusions of Preserved Blood*

	Blood-Dextrose-Citrate						Blood-Citrate					
		Reactions						Reactions				
Days of Storage	Number of Transfusions	Chills Only	Chills and Fever	Urticaria	Hemoglobinuria	Miscellaneous	Number of Transfusions	Chills Only	Chills and Fever	Urticaria	Hemoglobinuria	Miscellaneous
0	10	0	0	1	2	.....	285	1 (0.3%)	5 (1.7%)	2 (0.7%)	0	Note 1
1	20	0	1 (5.0%)	1 (5.0%)	1	.....	164	3 (1.8%)	8 (4.8%)	4 (2.4%)	1	.....
2	40	1 (2.5%)	0	0	0	Note 2	206	4 (1.9%)	6 (2.8%)	1 (0.4%)	1	.....
3	79	0	2 (2.5%)	0	0	.....	251	2 (0.7%)	4 (1.5%)	5 (1.9%)	0	Note 2
4	58	0	3 (5.1%)	1 (1.7%)	0	.....	197	2 (1.0%)	3 (1.5%)	3 (1.5%)	0	3 and 4
5	57	1 (1.7%)	1 (1.7%)	2 (3.5%)	0	.....	173	3 (1.7%)	5 (2.8%)	2 (1.1%)	0	.....
6	49	2 (4.0%)	0	0	0	Note 3	142	1 (0.7%)	3 (2.1%)	2 (1.3%)	0	3 and 5
7	35	0	0	0	0	Note 2	86	0	3 (3.4%)	2 (2.3%)	0	.....
8	44	1 (2.2%)	0	0	0	.....	61	0	0	0	0	Note 4
9	30	0	1 (3.3%)	0	0	.....	38	0	2 (5.2%)	0	0	.....
10	39	0	0	0	0	.....	28	0	0	0	0	.....
11	30	0	0	0	0	.....	10	0	0	0	0	.....
12	26	0	0	1 (3.8%)	0	.....	3	0	0	0	0	.....
13	20	0	0	0	0	.....						
14	30	0	1 (3.3%)	0	0	.....	2	0	0	0	0	.....
15	23	0	1 (4.3%)	0	0	.....	1	0	0	0	0	.....
16	23	0	0	0	0	.....						
17	16	0	0	1	0	.....						
18	9	0	0	0	0	.....						
19	17	0	0	0	0	.....						
20	14	1	0	0	0	.....						
21	15	0	0	0	0	.....						
22	22	0	0	0	0	.....						
23	13	0	0	0	0	.....						
24	9	0	0	0	0	.....						
25	7	0	0	0	0	.....						
26	11	0	0	0	0	.....						
27	6	0	1	0	0	Note 6						
28	2	0	0	0	0	.....						
29	9	0	0	0	0	.....						
30	3	0	0	0	0	Note 7						
31	5	0	0	0	0	.....						
32	2	0	0	0	0	.....						
33	1	0	0	0	0	.....						
36	1	0	0	0	0	.....						
38	1	0	0	0	0	.....						
Totals	776	6 (0.7%)	11 (1.4%)	7 (0.9%)	3	5	1,647	16 (0.9%)	39 (2.3%)	21 (1.2%)	2	7
	Total number of transfusions, 2,423.						Reactions of all types, 4.8 per cent.					

Legend:
Note 1, vomiting
Note 2, hemolytic reaction from injection of distilled water
Note 3, dyspnea
Note 4, epigastric pain
Note 5, death from incompatible blood
Note 6, death from cardiac embarrassment
Note 7, jaundice

The most frequent type of transfusion reaction proved to be the occurrence of chills and fever appearing during, or a few minutes after, the administration of the blood. This phenomenon occurred in 2 per cent of all transfusions. The temperature was usually down to normal within eight hours. In 0.9 per cent of the transfusions the recipients were observed to have chills or chilly sensations during or immediately after the administration of the blood, yet the body temperature remained normal. It was not thought that this reaction could be due to the temperature of the transfusion mixture since the incidence was so small. It was assumed rather, though not proved, that it was the result of the injection of small doses of pyogens.

5. Diggs, L. W., and Keith, A. J.: Problems in Blood Banking, Am. J. Clin. Path. **9**: 591-603 (Nov.) 1939.
6. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood: I. Various Factors Influencing Hemolysis, J. A. M. A. **114**: 850-855 (March 9) 1940.
7. DeGowin, E. L.; Hardin, R. C., and Swanson, L. W.: Studies on Preserved Human Blood: IV. Transfusion of Cold Blood into Man, J. A. M. A. **114**: 859-861 (March 9) 1940.
8. DeGowin, E. L.; Warner, E. D., and Randall, W. E.: Renal Insufficiency from Blood Transfusion: II. Anatomic Changes in Man Compared with Those in Dogs with Experimental Hemoglobinuria, Arch. Int. Med. **61**: 609-630 (April) 1938.

Urticaria or angioneurotic edema occurred in 1.1 per cent of all transfusions. In some cases the symptoms were so severe that the transfusion was discontinued. It was observed that some patients receiving multiple transfusions were more susceptible to this manifestation than others. No correlation could be found between the occurrence of urticaria and a history of allergic symptoms in either donor or recipient. It seems unlikely that the high plasma potassium content of the preserved blood was responsible, since there was no increase in incidence with transfusion of bloods of greater age.

In a previous paper [6] it has been shown that hemolysis is detectable in blood stored less than five days and that the rate of hemolysis varies greatly, depending on the preservative used. One criterion for the suitability of preserved blood for transfusion, therefore, is the amount of extracellular hemoglobin in the plasma. When the limits of storage are sufficiently rigid, hemoglobinuria should not occur from this factor. In five recipients of the series hemoglobinuria occurred. None of the patients suffered ill effects. In two the condition was deliberately produced by the injection of 11.8 Gm. and 1.6 Gm. of extracellular hemoglobin respectively. Another patient receiving 1.8 Gm., however, did not excrete any in the urine. Two other recipients belonging to groups A and AB, respectively, received preserved blood of group O containing little plasma hemoglobin (1 mg. and 721 mg. respectively), but they excreted hemoglobin in the urine. It is possible that the agglutinin and hemolysin titers of the donor's serum were so high that dilution by the recipient's blood did not inactivate it.

Some writers have reported a rather high incidence of jaundice from the transfusion of preserved blood. It occurred only once in our series. A woman received a transfusion without symptoms or signs of untoward reaction. The next day she was observed to be jaundiced. The serum van den Bergh reaction was 5.5 mg. per hundred cubic centimeters (indirect). The icterus disappeared in a few days; no hemoglobinuria occurred nor could free hemoglobin be detected in the blood serum eighteen hours after the transfusion. The fact that she had been receiving sulfanilamide for the preceding week may have been a contributing factor.

Two deaths occurred from blood transfusions. A woman belonging to group O received group A blood through a series of errors in the laboratory. When about 100 cc. of the blood had been given, the transfusion was discontinued because of the appearance of marked dyspnea, cyanosis and a feeling of constriction in the chest. The patient rapidly developed signs of shock and, in spite of the administration of epinephrine and transfusion with compatible blood, she died within six hours. A high content of extracellular hemoglobin was present in the blood serum of the recipient. The time of survival was not sufficient to determine whether renal insufficiency had developed. An infant weighing 7½ pounds (3,400 Gm.) was given 800 cc. of blood-dextrose-citrate mixture in the jugular vein. Cyanosis, dyspnea and generalized edema developed suddenly. Death occurred thirty-six hours later from circulatory embarrassment. Neither of these reactions was chargeable to the use of preserved blood per se.

When the reactions of all types are tabulated in categories corresponding to the age of storage of the blood (table 1) it will be noted that there is no significant correlation between the incidence of reactions and the age of the blood used. Nor is there a significant difference in reactions from the two types of preservatives employed. This statement should be qualified by stating that the limit of storage for the blood-citrate mixture was ten days while for the dextrose-citrate preservative the age limit was thirty days. No types of reactions were encountered from the use of preserved blood which were not already known to be complications of transfusions with fresh blood.

The manufacture of dextrose, saline and sodium citrate solutions, as well as the preparation of all apparatus used for intravenous administration of fluids and blood, was performed under unified supervision. Data were thus available which shed some light on the part played by pyrogens [9] in producing febrile transfusion reactions. Over a ten month period the incidence of chills only or of chills and fever from intravenous infusions was compared with the incidence of the same type of reactions occurring in blood transfusions (table 2). It was found that when the pyrogenic reactions from fluids were frequent there was a corresponding increase in the same type of reactions from blood transfusions. However, the incidence was always much higher in blood transfusions than in intravenous infusions. The only factors concerned in transfusions which were not present in the infusion were sodium citrate and blood. It is possible that pyrogens were present in the citrate solutions or that organisms were introduced during the collection of blood.

TABLE 2.—*Incidence of Chills Only or of Chills and Fever from the Injection of Dextrose and Saline Solutions Compared with the Same Manifestations Occurring in Blood Transfusions Using Apparatus Prepared in the Same Manner During a Ten Month Period*

	Intravenous Injections of Dextrose and Saline		Blood Transfusions	
	No. of Injections	Reactions	No. of Transfusions	Reactions
July 1939	1,113	32 (2.8%)	113	7 (6.6%)
August	1,185	12 (1.0%)	133	5 (3.7%)
September	1,397	4 (0.2%)	167	7 (4.1%)
October	1,210	3 (0.2%)	169	4 (2.3%)
November	1,015	3 (0.2%)	140	4 (2.8%)
December	1,225	0	229	8 (3.4%)
January 1940	1,285	9 (0.7%)	249	6 (2.4%)
February	1,068	2 (0.1%)	259	2 (0.7%)
March	1,561	12 (0.7%)	236	8 (3.3%)
April	1,233	4 (0.3%)	245	1 (0.4%)
Totals	12,292		1,940	

CONCLUSION

1. The incidence of all types of reactions was no greater from the transfusion of preserved blood than when fresh blood was used, provided proper care was taken in storing and handling it. The limits of storage time were arbitrarily placed at ten days for citrated blood and thirty days for the dextrose-citrate mixture.

2. Variations in the age of the blood used caused no corresponding variation in the incidence of reactions.

3. No types of reactions occurred from preserved blood which are not recognized as complications from transfusions of fresh blood.

9. Seibert, F. B.: Fever-Producing Substances Found in Some Distilled Waters, Am. J. Physiol. **67:** 90-104 (Dec.) 1923; ibid. **71:** 621-651 (Feb.) 1925.

4. The presence of pyrogens in fluids or apparatus is probably a cause of many febrile reactions during the transfusion of blood.

ABSTRACT OF DISCUSSION

DR. ALEXANDER S. WIENER, Brooklyn: The experiences of the authors with 1,940 transfusions of bank blood within a year place them in a position to evaluate the merits and demerits of preserved blood. They have an enviable record, considering the low incidence of transfusion reactions encountered, which is practically the same as our own reaction rate, though at our institution only fresh blood is used for transfusions. My experience with transfusions of bank blood has been limited to about thirty cases, rather intensively studied from the standpoint of the fate of the transfused erythrocytes in the patient's circulation. For this study, which was carried out in collaboration with Dr. George Schaefer, we made use of antiserums for the agglutinogens M and N of human red cells. Since these agglutinogens play no part in transfusion reactions they are disregarded when selecting donors for transfusion. For example, a patient of group A, type M, may be given blood of type AM, AN or AMN. When the M, N types of donor and patient differ the fate of the donor's cells in the patient's circulation can readily be traced with the aid of anti-M and anti-N agglutinating serums. Using this technic we found that, while fresh blood survived for periods up to 120 days in the patient's circulation, the maximum length of life of the transfused cells diminished roughly in proportion to the period of storage in vitro. In two cases in which transfusions of blood 20 and 21 days old respectively were given, the cells completely disappeared from the circulation of the patients within twenty-four hours. Based on these results we advised that the maximum period of storage of blood for transfusion be set at from seven to ten days. In our studies the blood taken for transfusions was kept in citrate solution; it is possible that the period of usefulness of the bank blood may be extended by the addition of dextrose as advocated by Drs. DeGowin and Hardin. However, from experiences on the preservation of blood cells for blood grouping my impression is that the fragility of the cells increases almost as rapidly when dextrose is added, even though the cells appear intact to the naked eye for longer periods. With regard to the occurrence of jaundice after transfusions of bank blood, we had only one experience, a gravely ill patient who had been given blood nineteen days old. The patient was reported to have become jaundiced during the two hours consumed by the injection of the blood, and the jaundice progressively deepened until the time of his death, six hours later. Many more cases of latent icterus were picked up by examining the patient's blood a few hours after the transfusion. The serum separated from this blood sample was noticeably icteric in comparison with the pretransfusion blood serum almost regularly in patients receiving blood more than one week old, while icterus did not occur when fresher blood was used.

DR. L. W. DIGGS, Memphis, Tenn.: The blood bank of the John Gaston Hospital, which is the charity hospital of the city of Memphis, has been in continuous operation since it was started in April 1938. The use of preserved blood has been accepted by the clinical staff as a practical and relatively safe procedure superior to the old volunteer system and particularly advantageous in the surgical and maternity services. During the first year of operation of the bank, 1,415 transfusions were given with a reaction percentage of 6.7 and five transfusion deaths, one of which was due to mismatching. During the second year 2,140 transfusions were given with 8.1 per cent reactions and one transfusion death. The reaction percentages for single months varied from 2.2 to 14.1. To test the effect of giving cold blood and to compare reactions with blood artificially warmed, an experiment was started in which the bloods were on alternate weeks warmed and on the next week given without warming except to the degree to which the equipment and tubing were exposed to room temperature. In 869 consecutive transfusions the reactions varied widely in various weeks, but there was no apparent relation between the reaction percentage and the temperature of the blood. The febrile reactions following the giving of 427 transfusions of cold blood were 8.2 per cent and the reactions following the giving of 442 transfusions of warm blood 7.9 per cent. The warming of blood takes time and requires special equipment. Warmth favors bacterial growth and cell disintegration. Overheating of blood is extremely dangerous and readily occurs when the heating is entrusted to inexperienced student nurses. One of our transfusion deaths was attributed to overheating of the blood. In the early days of the bank, when the bloods were heated in the wards, occasional flasks of blood were cooked on gas ranges. We think that it is safer to give blood cold than to attempt to warm it. The giving of hemolyzed blood is likely to result in reaction. A simple test of hemolysis which we regularly use is to collect a test tube of blood from the transfusion set at the time the blood is filtered in the giving flask. This blood is centrifuged and the supernatant fluid examined. When the concentration of hemoglobin in the supernatant is 100 mg. per hundred cubic centimeters or above, the fluid is definitely discolored and is considered to be unsafe for use. The rate of hemolysis of blood preserved by refrigeration in citrate solutions varies widely in different bloods, but the average rate of increase in hemoglobin in the supernatant plasma is about 10 mg. daily per hundred cubic centimeters and by the tenth day there is often gross hemolysis, and by the fourteenth day gross hemolysis is the rule.

DR. HYMAN I. GOLDSTEIN, Camden, N. J.: Because of a tragedy in my family last fall as the result of a blood dyscrasia I rise to ask a question. Our efforts have always been in the direction of the erythrocytes—compatibility tests and cross matching have been limited to the red blood cells. Why not increasing interest in the direction of the leukocytes, thrombocytes and kinetocytes, and the possibility of certain reactions after transfusions being due to these other cellular elements? It appeared to me in the case cited that the blood transfusions did not help and perhaps purged the few (normal?) white blood cells that the patient had as a result of acute myeloblastic leukemia, probably because of some unrecognized reactions. In reference to the cold blood used by the authors, I cite an experience in the case of a Newark physician who developed auto-agglutination with severe hemolytic changes, owing in part at least to the changed temperature of the blood. Luck and good fortune must have played a part in the authors' studies. Much progress has been made since Hieronymus Cardanus (1501-1576) and Magnus Pegelius (1593) mentioned the possibilities of transferring blood directly from the vessels of one person to those of another. Uncountable contributions to our knowledge of the blood and the use of blood transfusions have been contributed to the literature since Andreas Libayius (1615) first advocated blood transfusion and Johannes Colle of Padua suggested such a procedure. One need only mention the earliest contributions by Christopher Wren (1656), Richard Lower (1665), Jean Baptiste Denis, and Lower and King (Nov. 23, 1667). I wish to compliment Drs. DeGowin and Hardin on their studies on preserved human blood.

DR. ALVIN G. FOORD, Pasadena, Calif.: Most of the discussion concerning the use of preserved blood for transfusions has been limited to the changes in the red cells, and the previous discusser from Camden has brought up the question of the leukocytes. It appears to me that more should be said concerning the plasma, particularly changes in complement or opsonin content resulting from preservation. Little information is available except the work of Kolmer, who found rather rapid decrease in complement in a few days of refrigeration. Since about half of the transfusions in an average hospital are given in cases of severe infections with the idea of boosting the patient's resistance, partially at least from the effect of addition of opsonins, more information on the plasma should be obtained. I should like to hear from the speaker on this phase of the transfusion problem.

DR. ELMER L. DEGOWIN, Iowa City: It was my purpose to limit the discussion to the safety with which preserved blood can be given. The question of the efficacy of stored blood obviously cannot be settled in the time allowed nor is there enough information available at present to arrive at a satisfactory conclusion. Definite objective evidence of therapeutic effect can seldom be obtained from patients receiving transfusions because the picture is complicated by the course of the

primary disease and by other therapeutic measures. It is much less difficult to determine whether a transfusion is harmful. Aplastic anemia is one of the few clinical conditions in which one can decide whether transfused erythrocytes are fulfilling their physiologic function. We have under our care a patient with aplastic anemia who has been kept alive for the last eighteen months with transfusions of preserved blood. He receives a liter of stored blood every three weeks and is thus enabled to carry on his work. If the interval between transfusions is extended to four weeks, he returns with a lower erythrocyte level than after the three week interval. Because of our observations on this patient I am at a loss to interpret Dr. Wiener's experience in which the transfused agglutinogens disappeared so rapidly from the blood stream. The objection was raised that red cells stored with dextrose showed markedly increased "fragility" in hypotonic saline solutions. This is true but it has no clinical significance. Red cells are permeable to dextrose and therefore swell. The fragility test is merely an indirect measure of cell size. Erythrocytes swelling in dextrose solutions can be reduced again to normal size by washing with isotonic saline solution. Dr. Wiener referred to the increased color of the recipient's serum a few hours after transfusion as indicating hemolysis. It is important to determine whether the pigment resulted from cells which hemolyzed in the body or from the free hemoglobin which is practically always present in the plasma of stored blood. The question has been asked whether the leukocytes can be supplemented by transfusion of preserved blood. We cannot demonstrate any increase in the recipient's leukocytes after the transfusion of either fresh or preserved blood. By the term "cold blood" we refer to the preserved blood mixture which has not been deliberately heated. Actually, if blood directly out of the refrigerator is placed in the usual gravity apparatus for administration it soon approaches the temperature of the room as it passes through the rubber tubing. Dr. Kolmer has studied the rate of disintegration of complement during storage. I believe he found that the titer became low after ten days in the refrigerator.

POSTOPERATIVE ATELECTASIS

THE ANESTHETIST'S PART IN THE DIAGNOSIS AND TREATMENT

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The prevention and treatment of postoperative atelectasis are of great concern to all anesthetists, for proper management of the patient during and immediately following anesthesia in many instances probably will prevent the occurrence of such a catastrophe. Mismanagement in certain cases undoubtedly is responsible for the development of atelectasis following anesthesia.

Many theories have been advanced as to the etiologic factors involved in the production of atelectasis.[1] It has been suggested that edema of the mucous membranes, similar to angioneurotic edema, might produce enough obstruction to cause pulmonary collapse. Bronchial spasm has been suggested as a possible cause of atelectasis, but this hypothesis seems unlikely because bronchial spasm usually produces the antithetic condition; that is, emphysema with bilateral distribution. The "vasomotor theory" suggests that dilatation and stasis in the blood vessels might produce obstruction in the bronchioles by an outpouring of secretion. It is my opinion that most instances of postoperative atelectasis are caused by mechanical obstruction; that is, actual plugging of a bronchus or several bronchi by tenacious secretions which have been collected in the tracheobronchial tree during anesthesia, by mucopurulent material which was present preoperatively, or by mucus, blood or vomitus which has been aspirated into the trachea either during or immediately following anesthesia.[2]

The onset of actual atelectasis probably is gradual. The bronchus becomes plugged, causing preliminary emphysema. If this plug is not removed by aspiration or if the patient is unable to remove the plug by coughing or by change of position, the air in the involved region will be slowly absorbed in the blood stream until pulmonary collapse is complete.[3]

The symptoms of and observations made concerning postoperative atelectasis usually follow a rather definite pattern. The patient complains of dyspnea, which frequently is out of proportion to the degree of pulmonary involvement present. There is usually a sense of discomfort over the lung involved, the pulse becomes rapid, there is a sudden increase in temperature and cyanosis becomes apparent, the degree of cyanosis depending on the amount of pulmonary tissue involved, and breath sounds become diminished or absent. In the presence of massive atelectasis the heart and mediastinal structures are shifted toward the side involved and the respiratory excursion on the affected side becomes diminished.

Many details must be attended to before and during anesthesia as well as postoperatively if the incidence of postoperative atelectasis is to be reduced. Preoperative sedation may have an effect on the development of pulmonary complications. It is a routine procedure for heavy smokers, patients suffering from chronic sinusitis and patients suffering from chronic pulmonary or respiratory infections of any kind to spend considerable time clearing their nasopharynx and tracheobronchial tree of the accumulated secretions immediately after rising from bed. Heavy smokers almost always have tenacious mucus in their air passages. Patients who receive a sedative in the evening often awaken in the morning in somewhat of a stuporous condition. Their reflexes have been dulled by the action of the sedative. Additional sedatives are usually administered early in the morning, and the patient again drifts off into a restful sleep. As a result he has had no chance or urge to clear his airway of the secretions which have accumulated during the night. It might be well to place the patient in a vertical position and encourage him to clear his nasopharynx and tracheobronchial tree before the sedative is administered in the morning. In this way much offending material might be removed.[4] The use of atropine or scopolamine reduces the amount of salivary secretion during induction of anesthesia and no doubt makes possible a much smoother induction than could be obtained had not such drugs been administered. However, it is possible that these drugs may be responsible for the drying of secretions which are present until they become so tenacious that the ciliated epitheliums are unable to move them up into the trachea. It is important to have a patient's stomach empty and to be sure that no loose teeth or foreign bodies are present in the patient's mouth, for the aspiration of any foreign body is almost sure to produce atelectasis. Obstruction of any kind to the airway should be relieved

From the Section on Anesthesia, the Mayo Clinic.
Read before the Section on Miscellaneous Topics, Session on Anesthesia, at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

1. Scott, W. J. M.: Postoperative Massive Collapse of the Lung, Arch. Surg. **10**: 73-116 (Jan.) 1925.

2. Mousel, L. H.: Bronchoscopic Treatment of Postoperative Atelectasis, Proc. Staff Meet., Mayo Clin. **15**: 261-264 (April 24) 1940.

3. Faulkner, W. B., Jr., and Faulkner, E. C.: Postoperative Massive Collapse of the Lung: Its Cause, Prevention and Treatment, Northwest Med. **32**: 87-92 (March) 1933. Glickman, L. G., and Minsky, A. A.: Postoperative Massive Pulmonary Collapse, M. Bull. Vet. Admin. **15**: 415-417 (April) 1939.

4. Mousel, L. H.: Unpublished data.

immediately, for if obstruction is allowed to remain for any length of time the decreased intrapulmonary pressure on inspiration may cause extravasation of fluids into the alveoli and bronchi.[5] After the obstruction has been relieved, it might be well to have the patient breathe the anesthetic gases against 6 or 7 cm. of water

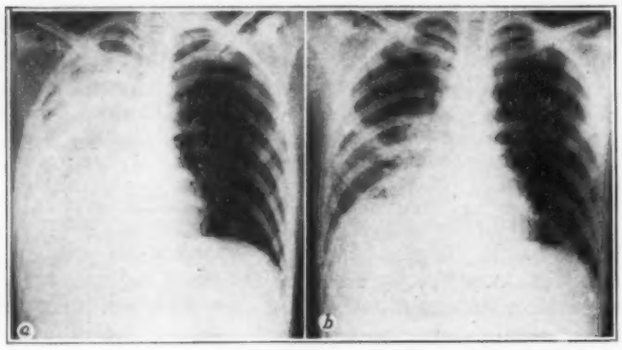

Fig. 1 (case 1).—*a*, massive collapse of the right lung with a shifting of heart and mediastinal structures to the affected side; *b*, appearance four hours after bronchoscopic aspiration.

pressure for a few minutes to relieve any edema which might have occurred during the period of obstruction.[5]

If the patient has any amount of secretion in the airway at the termination of anesthesia or if he has vomited during anesthesia and the material has been drawn into the lungs, before he is returned to his room the pharynx, trachea and bronchi should be well aspirated. It is probably best to do the tracheobronchial aspiration by the direct vision method through a bronchoscope so that each separate lobe bronchus can be visualized and cleaned of any foreign material. After the patient has been returned to his room, the inhalation of 5 or 10 per cent carbon dioxide and oxygen at hourly intervals often will expand the lobe of the lung which has been collapsed. However, this method does not always produce the results desired, for it may pull a plug of mucus or foreign material deeper into the bronchus.

Morphine and other sedatives should be used sparingly during the first few hours following anesthesia, so that the patient's reflexes may return to as near the normal state as possible. The patient should be turned frequently in bed and encouraged to breathe deeply and to cough. If atelectasis does occur postoperatively, the bronchial obstruction should be removed as soon as the condition has been recognized, for if atelectasis is allowed to exist for many hours secondary pneumonitis or pulmonary suppuration is likely to develop. It is obvious that the ordinary methods of treating atelectasis, such as the patient's inhalation of carbon dioxide and oxygen, frequent turning of the patient and coughing are not likely to relieve the condition if these procedures have been carried out in an attempt to prevent atelectasis from developing. The throat of the patient should be well cocainized by means of the application of pledgets of cotton carrying a freshly made 20 per cent solution of cocaine. The pledgets should be pressed between the fingers to remove the excess solution of cocaine before they are placed in the pyriform fossa. One pledget carrying cocaine should be passed and held directly between the vocal cords for a few seconds before the bronchoscope is passed. After cocainization of the throat has been completed, the bronchoscope usually can be passed without difficulty. Each lobe bronchus should be visualized and all foreign material aspirated from it. Following bronchoscopy, the administration of oxygen or carbon dioxide and oxygen is continued. The patient should be turned from side to side frequently and he should be encouraged to cough.

5. Barach, A. L.; Martin, John, and Eckman, Morris: Positive Pressure Respiration and Its Application to the Treatment of Acute Pulmonary Edema, Ann. Int. Med. **12**: 754-795 (Dec.) 1938.

REPORT OF CASES

CASE 1.—There was nothing unusual in the clinical history of a woman aged 26 with the exception of chronic infection of the upper part of the respiratory tract. Appendectomy and cauterization of the cervix were done under nitrous oxide-oxygen and ether anesthesia. Anesthesia was uneventful. Twelve hours after operation the patient began to cough. Some musical inspiratory rales were heard over the thorax, but the thorax was resonant throughout. Twenty-four hours after operation the patient complained of "lower chest pain" referred through to the back. At this time there were distant breath sounds on the right, and the entire right side of the thorax was dull to percussion. Some bronchial breathing could be heard over the upper third portion of the right lung. The temperature at this time was 98.5 F. The patient became cyanotic. Roentgenologic examination of the thorax showed massive atelectasis of the right lung (fig. 1 *a*). The patient was turned frequently from side to side, 5 per cent carbon dioxide in oxygen was administered at hourly intervals, and she was encouraged to cough. Cyanosis persisted and on the second postoperative day the patient's temperature was 101.4 F.; massive atelectasis was still present. Bronchoscopic examination disclosed an inflammatory reaction to be situated around the right middle and lower lobe bronchi. A small amount of thick, tenacious mucus was aspirated from the right middle and lower lobe bronchi. The lower lobe bronchus was edematous and almost completely closed. Gentle dilation was carried out. Following dilation of the edematous tissue a small, tenacious mucous plug could be seen. This mucus was removed by aspiration. Four hours after bronchoscopy there was no dulness over the right side of the thorax. Fourteen hours after bronchoscopy there was evidence of consolidation in the right lower lobe; however, this condition rapidly disappeared and on the fifth postoperative day the thorax was clear and the body temperature receded to normal. Convalescence was uneventful. It was interesting to note the ball-valve action of the mucous plug which was found distal to the endematous mucous membrane in the right lower lobe bronchus, for, following aspiration, the atelectasis apparently completely disappeared, but it was found to be present again

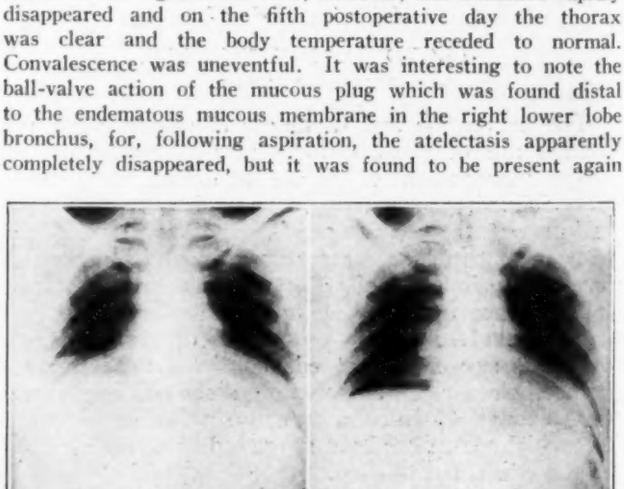

Fig. 2 (case 2).—*a*, atelectasis of the right lower lobe; *b*, complete aeration of the right lower lobe ten hours after bronchoscopic aspiration.

fourteen hours after aspiration. I assume that the edema continued to obstruct the bronchus after aspiration and atelectasis once more developed in the right lower lobe. However, the irritating mucous plug had been removed, so that the edema soon subsided and the lobe once more became filled with air (fig. 1 *b*).[2]

CASE 2.—An obese woman aged 31 had a slight cough on admission to the hospital. Cholecystectomy was done under nitrous oxide-oxygen, carbon dioxide and ether anesthesia.

Anesthesia was uneventful. Twenty-four hours after operation the patient had a chill which lasted five minutes. She complained of pain in the right lower portion of her thorax. There were decreased breath sounds and decreased resonance over the base of the right lung. Her temperature was 100.6 F. Roentgenologic examination of the thorax showed atelectasis to be present in the right lower lobe (fig. 2 *a*). The patient was submitted to bronchoscopy immediately. The right lower lobe bronchus was completely plugged with very tenacious glistening white mucus. The right middle lobe bronchus contained some mucus. The membrane of the entire right main bronchus appeared to be inflamed. There was no visible edema. The mucus was aspirated and the patient was sent back to her room. A half hour after aspiration the patient stated that she felt much better, and there were no physical signs of atelectasis at this time. Roentgenologic examination of the thorax on the following morning showed the right lower lobe to be completely aerated (fig. 2 *b*). The patient continued to have a productive cough for several days; otherwise, convalescence was uneventful.[2]

CASE 3.—A man aged 41 came to operation with a diagnosis of right hydronephrosis. Urethronephrostomy and nephrostomy were done under spinal and pentothal sodium anesthesia. Twenty-four hours following anesthesia the patient became somewhat dyspneic and there were decreased breath sounds at the base of the left lung. Inhalations of carbon dioxide and oxygen were administered every half hour. The patient

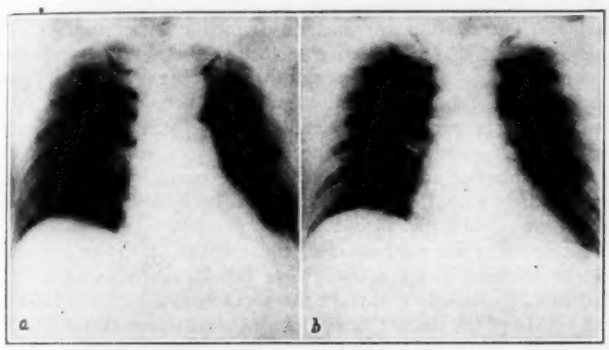

Fig. 3 (case 3).—*a*, atelectasis of left lower lobe with elevation of diaphragm and shifting of mediastinum; *b*, complete aeration of left lower lobe following bronchoscopy.

was turned frequently in bed and was encouraged to cough. Forty-eight hours after anesthesia the patient became cyanotic, the body temperature suddenly increased to 103.2 F., the pulse rate was 124 beats per minute and respiration was 30 per minute. Roentgenologic examination of the thorax showed mediastinal shift and elevation of the diaphragm of the involved side with some fogging of the costophrenic angle on the left (fig. 3 *a*). The patient underwent bronchoscopy, topical anesthesia being used. A large amount of very thick tenacious green mucus was aspirated from the left main bronchus and left lower lobe bronchus. Mild bronchitis was present on the left. The patient was relieved of symptoms immediately following bronchoscopic aspiration. Eighteen hours following aspiration the body temperature was 98.6 F. and remained near that figure; respiration and pulse were decreased within normal limits. Roentgenologic examination of the thorax showed it to be clear (fig. 3 *b*).

CASE 4.—A woman aged 44 came to operation because of a stone in the left kidney. Pelviolithotomy was done under spinal anesthesia. Forty-eight hours after operation the patient complained of pain in the right portion of the thorax near the sternum. The respiratory rate was 34 per minute and respiration was grunting in character. The temperature suddenly increased to 102.8 F., the pulse rate 135 per minute. The patient became dyspneic and somewhat cyanotic. She had been coughing up some amount of sputum since operation. The usual measures had been carried out in an attempt to prevent atelectasis from developing. On physical examination breath sounds were found to be greatly diminished over the entire right side of the thorax. Roentgenologic examination of the thorax confirmed the diagnosis of pulmonary atelectasis on the right (fig. 4 *a*). The patient underwent bronchoscopy under topical anesthesia. The right main bronchus was found to contain at least 1 tablespoon of thick mucopurulent material. Severe bronchitis was present on the right. Rather marked edema of the right lower lobe bronchus was noted. All visible mucus was removed by aspiration. At the time of bronchoscopy

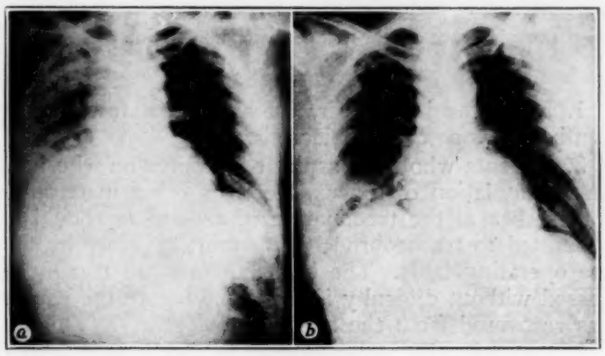

Fig. 4 (case 4).—*a*, massive atelectasis of the right lung with shift of mediastinum; *b*, aeration of entire right lung.

I doubted if this patient would derive much benefit from the procedure of aspiration, for the inflammatory reaction was so marked that it appeared that pneumonitis was certain to develop. Within a few minutes following bronchoscopy the breath sounds were coming through in a normal manner over the entire right lung. The patient felt much better and the temperature and pulse rate both decreased rapidly. Twelve hours following bronchoscopic aspiration the results of roentgenologic examination of the thorax were negative for atelectasis (fig. 4 *b*). The body temperature was 97.8 F., pulse rate 100 and respiration 20 per minute. Recovery of the patient was uneventful.

CASE 5.—A man aged 48 was submitted to cholecystectomy, choledochostomy and appendectomy. The operation was done under nitrous oxide, carbon dioxide and ether anesthesia. Twenty-four hours after operation the patient complained of pain on inspiration. The breath sounds were decreased over the base of the right lung. Routine inhalations of carbon dioxide and oxygen with frequent moving of the patient in bed were started at this time. Twelve hours later there was a progression of symptoms. Rhonchi could be heard over both lungs. The patient began coughing up bloody sputum. Cyanosis grade 2 was present. The patient was placed in an oxygen tent and improvement resulted almost immediately. On the

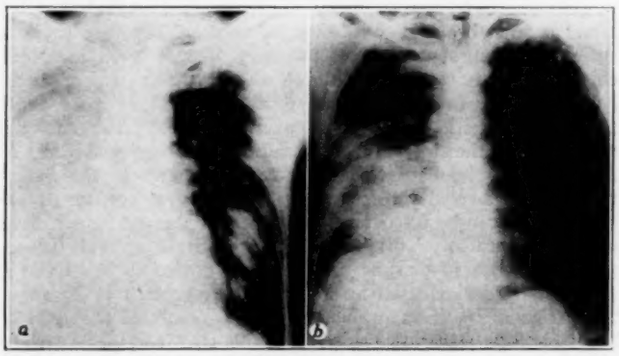

Fig. 5 (case 5).—*a*, atelectasis of entire right lung; *b*, aeration of right lung, residual bronchial pneumonia.

third postoperative day the patient became much worse and cyanosis was present in spite of the oxygen which was being administered. The temperature rose to 101.5 F., pulse 100 per minute and respiration 25 per minute. A diagnosis of atelectasis of the right lung was made (fig. 5 *a*). The patient underwent bronchoscopy under topical anesthesia. A fairly large amount of mucopurulent material was removed from the right main bronchus and a small amount of purulent material was taken from the left main bronchus. Immediately following broncho-

scopic aspiration the patient looked and felt much better. The breath sounds were coming through over the base of the right lung at this time. A roentgenogram of the thorax taken immediately following bronchoscopy showed marked improvement (fig. 5 *b*). The body temperature dropped to 99.8 F., the pulse rate was 76 and the respiratory rate 18 per minute within a short time after bronchoscopy. Inhalation of carbon dioxide and oxygen and frequent turning of the patient were resumed. Low grade bronchial pneumonia was treated; otherwise convalescence of the patient was uneventful.

CONCLUSIONS

1. Much can be done by the anesthetist toward preventing postoperative atelectasis.

2. Patients who have aspirated vomitus or who have an accumulation of mucus, blood or other material in the trachea at the termination of anesthesia should be submitted to tracheobronchial aspiration before leaving the operating table. The bronchoscope can usually be passed without difficulty if it is done before the patient has recovered from the anesthetic.

3. Postoperative atelectasis can be successfully treated in most instances by bronchoscopic aspiration.

4. Bronchoscopic aspiration should be carried out as soon as possible after the diagnosis is made in order to prevent pneumonitis or pulmonary suppuration.

ABSTRACT OF DISCUSSION

DR. URBAN H. EVERSOLE, Boston: The aspiration of fluid from the respiratory passages for the prevention and treatment of pulmonary complications due to atelectasis cannot be overemphasized. Unfortunately, bronchoscopy has too often been looked on as a hazardous procedure to which a seriously ill patient should not be submitted. I have become convinced that it is not a hazardous procedure. All patients who have demonstrated their inability to reexpand a collapsed portion of the lung spontaneously or to raise fluid which has accumulated in the tracheobronchial tree should immediately be submitted to this procedure. There are many patients who have evidence of a large amount of fluid in the tracheobronchial tree which they are unable to raise spontaneously but who do not have evidence of definite areas of atelectasis. Simple aspiration of this fluid through a number 22 French urethral catheter is frequently all that is necessary. This procedure may be carried out after spraying the pharynx with cocaine. The catheter can best be introduced through the nose and guided into the larynx by means of forceps under direct vision through a laryngoscope. There is another group of patients in which I have found suction bronchoscopy of great value. These are patients suffering from suppurative pulmonary disease such as bronchiectasis or lung abscess. Even though these patients may have been treated by postural drainage for long periods of time, the induction of general anesthesia may result in the release into the larger air passages of large quantities of fluid. This release of fluid may be quite early in the induction and before there is sufficient relaxation for an intratracheal tube to be introduced with facility, through which fluid can be aspirated. This fluid may constitute a real danger to the patient's life, as he may actually drown in it. Even if this fluid is not released in amounts large enough to endanger the patient's life from drowning, it may result in a spread of the infection. I have adopted the following routine: 1. The patient is brought to the operating room and under cocaine topical anesthesia a thorough aspiration of the respiratory passages through a bronchoscope is performed. 2. The bronchoscope is removed and an intratracheal tube is immediately inserted while the patient is still awake. 3. General anesthesia is now induced with the intratracheal tube in place. Fluid that may accumulate during the course of the operation can be aspirated through the intratracheal tube by means of a urethral catheter. 4. Immediately after the operation is ended a thorough aspiration of the tracheobronchial tree is again carried out through a bronchoscope while the patient is still under general anesthesia. 5. During the course of their convalescence these patients are submitted to suction bronchoscopy as often as there is evidence of fluid accumulation which they are unable to raise themselves.

DR. HERMAN J. MOERSCH, Rochester, Minn.: Dr. Mousel's presentation is valuable and timely. He has emphasized the importance of postoperative pulmonary complications and the important role the anesthetist should play in the prevention, the diagnosis and the treatment of postoperative pulmonary complications. Postoperative pulmonary complications may occur in about 10 per cent of patients who undergo operation on the stomach and duodenum, and in about 4 per cent of those who undergo operation on the lower part of the abdomen. Massive atelectasis of the lung was first described by Pasteur in 1890, but scant attention in this country was paid to its importance until after the first World War. Its great importance in relation to postoperative pneumonia is now appreciated. The hypothesis most generally accepted is that which postulates that postoperative pulmonary atelectasis occurs as a result of obstruction of the bronchus due to aspiration of material into the bronchus in the course of the operation, or retention in the bronchi of secretions which normally are expelled. Support for this hypothesis is given in the studies of Gray, who found that he could reduce the incidence of postoperative pulmonary complications by about 30 per cent simply by placing the patient in the Trendelenburg position after operation. It is my opinion that, if it was possible for the patient to leave the operating room with a so-called dry lung and to remain in that condition until the cough reflex returns, we could eliminate almost entirely postoperative pneumonia. There are many methods which can be employed in the treatment of postoperative atelectasis. Among them bronchoscopy holds a very important position, as it permits the aspiration of retained secretions the presence of which in the bronchial tree produces the atelectasis. There may be some difference of opinion as to who should carry out the bronchoscopic aspiration when indicated after operation. The ideal arrangement would be to have a skilled bronchoscopist available at all times, but this is not always possible. When a skilled bronchoscopist is not available, the anesthetist, if he has had proper training in the procedure of bronchoscopy, is in a very favorable position to carry out the procedure, for no one follows the course of the patient more closely than the anesthetist during and immediately after operation. By such an arrangement I am sure that many a life that otherwise might be lost because of postoperative pneumonia would be saved.

DR. F. ELMORE HUBBARD, Montclair, N. J.: I should like to ask what type of bronchoscope the doctor has recommended.

DR. LLOYD H. MOUSEL, Rochester, Minn.: I am glad that Dr. Eversole mentioned suction through a soft rubber catheter. This procedure can be carried out satisfactorily in many instances, particularly if an intratracheal tube is in place. If a bronchoscope is not available, suction through a catheter should then be carried out in an attempt to remove all foreign material from the tracheobronchial tree. Aspiration through a bronchoscope gives the anesthetist the advantage of being able to visualize each separate lobe bronchus and leaves nothing to chance. Foreign material or mucus then can be aspirated from each separate lobe bronchus. I use a Negus bronchoscope because I received my training with that particular instrument. The Negus bronchoscope has the advantage of having both proximal and distal lighting. There are several good bronchoscopes on the market. Any of them should be satisfactory.

Mental Factors.—The commonest mental factors derived from the immediate environment are financial and business worries, domestic difficulties, dissatisfactions of all kinds, disappointments and worries in the sexual sphere and deaths of relatives. It is such situations as these that the individual, especially the susceptible individual, finds it difficult to face. He may surmount one difficulty successfully only to go down before an accumulation of troubles. It is not the situation itself that matters, but what the subject feels about it.—Henderson, D. K., and Gillespie, R. D.: A Text-Book of Psychiatry for Students and Practitioners, London, Oxford University Press, 1940.

THE MENTAL HYGIENE ASPECT OF THE TRAFFIC ACCIDENT

LOWELL S. SELLING, M.D., PH.D., DR.P.H.

DETROIT

In 1937 motor vehicle accidents were ninth in the list of ten principal causes of death in the United States. In spite of this, public health authorities have not given this cause of death as much attention as they have to others. When one realizes that in that year 39,643 persons died in highway accidents [1]—a mortality rate of 30.7 per cent—one must admit that if public health authorities, psychiatrists and others interested in the medical aspect of life and death can take any part in the solution of the traffic accident problem it is their duty to do so.

One can emphasize this even more definitely by pointing out that among persons in the youth range, from 5 to 19 years of age, in 1937 motor vehicle accidents were the second highest cause of death,[1] and that in 1939, while the death rate decreased, resulting in only 32,100 deaths, the number of persons injured was appallingly large, 1,210,200.[2]

One reason, undoubtedly, why health departments and mental hygiene clinics have not taken an active interest in attempting to control this phase of mortality and morbidity is that the work seemingly is being fairly well done by other agencies. Whereas the health departments collect statistics through birth and death certificates, the police departments, with their accident investigators, not only are able to determine the fact that a victim died or was injured but can secure all of the accompanying data that might be used to educate the public or to point out the need for specific engineering changes on the highway. The material for the selection of such data is not in the hands of health departments, and it need not be, for it is frequently necessary to make arrests at the scene of the accident, which is the duty of the police and not of the health authorities.

In spite of the fact that the Psychopathic Clinic of the Recorder's Court has been actively engaged in studying traffic offenders since August 1921 and, in 1929, reported the psychiatric observations in a group of 100 cases,[3] the attention of psychiatrists and public health authorities has not been extensively directed toward the traffic problem.

While there are, perhaps, a half dozen psychologists with scientific training directed toward the analysis of human mental processes, too few experts who are medically trained along the same line, that is, psychiatrists, have taken an interest in this problem; yet it is undoubtedly true that physicians practicing in mental hospitals and mental clinics frequently have the traffic angle of their cases brought directly to their attention. But the treatment and correction of the traffic problem through psychiatric means are not in the minds of most psychiatrists, since their practice in clinics and hospitals is overshadowed by the problem of correcting the ailment rather than of considering the ailing person in the light of a potential traffic menace.

THE PLACE OF MENTAL HYGIENE

The question must be raised of how much of a role mental hygiene can play in the prevention of traffic accidents. In analyzing statistics with regard to the causes of death one finds, for instance, that it is not the inexperienced driver who gets into trouble, for 95 per cent of operators involved in accidents in 1939 had had a year or more of experience in driving an automobile.[4] Eighty-five per cent of accidents occurred on clear dry days [5] and in 77 per cent of cases the pavement was dry,[6] so that weather does not play a predominating part. Seventy-six per cent of the cars were going straight when involved in the accident;[7] 35 per cent of the accidents occurred between intersections and 13 per cent on the straight highway.[8] On this basis one cannot emphasize engineering as being to blame, for the engineers have provided straight safe highways.

The question of mechanical failure of the car is often brought up. It must be admitted that statistics on this subject are poor, since an automobile which is involved in an accident sufficiently serious to be reported is usually thrown out of adjustment in many ways so that a test of the car after the accident does not give accurate information as to its condition previous to the accident. The assumption was made in a report in 1937 by the Michigan State Police, covering a two months period, that only about 2 or 3 per cent of accidents could be ascribed to mechanical failure of the car. I myself believe that this percentage is too high because a great number of cars, even new ones, may be out of optimal adjustment at any given time, but the apt and careful driver learns to compensate quickly and mechanically for these changes in adjustment, and, although he has the trouble rectified as soon as possible, many cars which are not in good adjustment are on the streets but are never involved in accidents.

This throws the problem directly back on the human element. Pedestrians account for 38.9 per cent of deaths and 24.3 per cent of injuries as a result of traffic accidents. The pedestrian in many instances, was more to blame than the driver, which emphasizes the fact that the human element remains important whether the person at fault is the pedestrian or the driver.

It is, of course, much easier to prescribe therapy for the driver because he must be licensed and, as in Detroit, may have to be examined as a part of the licensing procedure or as part of the evaluation of his guilt if he commits a traffic offense. Pedestrians—except in cases of fatal accident in which an autopsy is done—cannot be subjected to physical, and certainly not to mental, study.

Nevertheless, it is known that alcoholism plays an important part in pedestrian deaths and that physical failure due to age or illness is also important. Pedestrian control is as important an aspect of the psychologic prevention of traffic accidents as is driver control.

On the basis of all the previously presented facts, I should be inclined to eliminate the engineering aspect of accidents and to consider the two current therapies of enforcement and education as being closely associated with mental hygiene. The rationale which lies

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Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

1. Physicians' Handbook on Birth and Death Registration, United States Department of Commerce, Bureau of the Census, 1939, table 4, p. 86.

2. Smash Hits of the Year—The Travelers 1940 Book of Street and Highway Accident Data, Hartford, Conn., Travelers Insurance Company, 1940, table I, p. 3.

3. Raphael, Theophil; Labine, A. C.; Flinn, H. L., and Hoffman, L. W.: One Hundred Traffic Offenders, Ment. Hyg. **13**: 809-824 (Oct.) 1929.

4. Smash Hits of the Year, table 8, p. 24.
5. Smash Hits of the Year, table 9, p. 25.
6. Smash Hits of the Year, table 10, p. 25.
7. Smash Hits of the Year, table 12, p. 28.
8. Smash Hits of the Year, table 13, p. 29.

behind proper enforcement cannot be considered in great detail here. Police procedures, through long devolution, became more or less indifferent toward the physical and mental aspects of the offender until the establishment of criminologic clinics during the past quarter of a century. Even now the clinical aspect is a minor consideration in enforcement, and the individual as a mental health problem does not exist for the policeman who has a routine to follow and whose effectiveness is determined more or less by the number of arrests he can make and the assurance in any community that a violation will be followed by a sure arrest. In other words, in enforcement the mechanism of fear is emphasized, and, while fear has its therapeutic uses, the application of it by the police perhaps engenders other emotions which eventually defeat the purpose of strict enforcement.

It must be admitted that traffic officers in most large cities are given a certain amount of leeway in their power of arrest and can give warnings and advice. The value of such warning and advice must rest on the personality of the officer and his individual insight, and of course, since there is such a plethora of policemen, the range of therapeutic aptitude must be extremely broad.

MENTAL HYGIENE METHODS

The problem, then, rests directly with mental hygiene, and the mental hygiene approaches are twofold: educational and clinical.

Most public health education springs from one of the central public health agencies or, in the larger cities, from the departments of health themselves. The methods of publicity and procedures similar to those used in health education are frequently utilized by the police and by private agencies, such as automobile clubs and insurance companies, in education in accident prevention.

I feel that radio and newspaper education along safety lines are superior in some ways to those which have been invoked in the past by smaller health agencies for disease control. There are, of course, more funds available from insurance companies and their ilk than from municipal fiscal authorities. This would make a difference in preparing an interesting radio program. When there can be a little insurance advertising, commercial firms with funds can pay for better hours on the air and better prepared programs.

I made a simple survey of the situation in Detroit. I found that practically every type of educational facility which is mentioned as being of value in health education is being applied to the safety problem. There is, of course, some incoordination because of the fact that each sponsor of a radio program and each municipal department has its own ideas—often inept and amateurish—of how results are to be obtained. Data submitted over the air are not based on scientific study, and the attention of the listener is directed toward what the individual agency considers advisable rather than toward what might be uniformly considered a good procedure. By that I mean that on one day there may be a radio talk from one station dealing with speeding which flatly advises against driving over a certain rate, while the next day another station may discuss the prima facie speed limit which permits persons to evade the speeding laws by virtue of the fact that, when no lives are endangered, speed need not be limited.

This is different from health education work, which in Michigan is being done by a centralized council in which all radio and at least one newspaper production, no matter on what medical subject, are submitted to committees of the local and state health agencies.

In Detroit the following traffic educational programs were employed during May 1940: On the five principal radio stations a series of talks was presented once a week; the police department had charge of this; in addition, there was an entertainment program by the local motor club which contained safety advice; the two leading Detroit newspapers carried a safety cartoon once a week, and occasionally such a cartoon appeared oftener than that. There is no safety dramatic radio program at the present time or any continued safety educational column like that of Logan Clendening in the field of medicine. The foreign language newspapers are not being systematically used, although 35 per cent of the patients coming through the clinic are foreign language speaking. There is a poster campaign in English on the street cars and busses advising the pedestrian; these posters are produced by the Detroit Industrial Safety Council, which, it might be said, by means of campaigns has vastly cut down the number of traffic accidents among employees of the various industrial plants in the city. These employees have even reduced their accident records when not driving plant vehicles. There is, however, nothing except this poster campaign directed toward the pedestrian.

There is but little active campaigning directed against the drunken driver in the sense of preventing him from drinking and driving. There is much newspaper talk but little tendency toward the psychiatric control of drinking. If drinking, at least excessive drinking, is an escape mechanism, that mechanism must have a basis in some problem from which the person desires to escape. Such problems must be solved clinically by a lawyer, a physician or, more properly, a psychiatrist. The amount of psychiatric help needed for drinkers is obviously great when one realizes that 7.3 per cent of the drivers involved in accidents in 1937 had been drinking and that 12.9 per cent of the pedestrians killed in that year had also been drinking.[9] This offers a serious problem, which is not to be solved by the mere creation of apparatus for determining the amount of alcohol in the body fluids of the driver in order to obtain a conviction for drunken driving.

If a man is chronically alcoholic, at least from a psychiatric standpoint, punishment will not keep him from drinking. Of course, a second conviction of drunken driving in Michigan makes it mandatory that his license be revoked, so that he can no longer drive. Most of the drunken drivers who have been referred to the Psychopathic Clinic have had but little consumption of alcohol at the time of the offense, but rather have taken a small amount on an empty stomach when under tension, resulting in a more serious situation than the abnormal imbibition of the heavy drinker, which causes him to lose consciousness or makes his behavior so obviously incompetent that his friends will not permit him to drive.

THE CLINICAL APPROACH

The next phase of accident prevention from the psychiatric standpoint rests in the hands of clinics. The usual procedures of mental hygiene clinics are on the whole applicable to the driver, but we at the clinic have found that special standards and additional examination processes are necessary. As an example, in the case of a refractive disorder of the eyes it is

9. Death Begins at 40, Hartford, Conn., Travelers Insurance Company, page 11.

known that significant eyestrain or difficulty in reading print occurs in children at a certain level, presumably about 20/50 in each eye. To carry this problem of acuity of near vision over into traffic would be manifestly unfair because traffic is a far vision problem. Some standards set up at the present time on the basis of visual deficiency in reading must still be open to question when applied to traffic.

From the standpoint of mental hygiene we have no standards except that we recognize that psychotic and feebleminded persons should not drive. It is manifestly impossible to make a psychiatric examination of all candidates for a driver's license—the expense in money and time would be prohibitive.

In Detroit a system has been worked out by the police department which to some extent solves the problem. When a person is adjudged insane in the probate court, a record of this adjudication is sent to the secretary of state's office in the state capitol and the psychotic person's license is revoked. All candidates coming before the licensing examiners of the Detroit police department have their records checked with the psychologic clinic of the board of education, and those who have been diagnosed as feebleminded are, as a rule, refused a driver's license. Where the deadline should be drawn in a case of this sort, i. e. under what conditions a person with borderline feebleminedness should be permitted to drive, is still a question. The answer in this type of problem seems to be individual clinical examination by trained examiners.

Some sort of screening process is necessary to make the best use of clinics, because in our experience a thorough survey of a driver is not possible in less than four hours. Many of the stupid or extremely maladjusted persons who come into the clinic require over a day, which would mean eight hours or more for examination. Our examination consists of the usual mental hygiene procedures of a physical examination, application of the proper psychologic tests, taking the social history and coordinating all of these with a psychiatric examination. In addition, for the mechanical problems of traffic we have had to devise and adapt a number of aptitude tests for reaction time, judgment of speed and distance, color blindness and knowledge of traffic laws, as well as other traits which need no enumeration here.

Each one of these special procedures is of importance; even the physical examination beyond obvious capacity to show organic competence to manipulate car controls is of value from the mental hygiene point of view. A case was brought to our attention characterized by extremely aggressive behavior on the part of a driver. He had a tendency to speed, to cut in and out of traffic and to fail to stop at stop streets. The physical examination revealed that he had had encephalitis and at the present time presented an obvious parkinsonian syndrome. On actual mechanical aptitude tests he was not so retarded that under ordinary conditions he would not be a safe driver, but his whole attitude indicated a compensatory reaction because of his rejection by girls. His problems in other spheres brought forcibly to our attention that it was not the crippling effect of the disease but its effect on the patient's mentality and his attitude that was of greater importance.

The social history in the case of a traffic offender is of great value. Careful analysis of reckless drivers, of whom we see a great many, directly reveals to us some basic reasons for drivers getting into trouble. For instance, the boy who is suppressed by his parents and is not allowed to drive until he can get a license of his own volition borrows the cars of others and drives madly. One cause of such behavior is bravado, to show his parents that he can do things contrary to their beliefs.

Almost every phase of the social history—childhood, schooling, occupational adjustment, marital and sexual relations and recreational habits—may have a bearing on the person's attitude toward driving. For example, it is not infrequent to have a man who is browbeaten by his wife—evidence of which comes out in the marital part of the history—become very aggressive when behind the wheel of a high powered vehicle, when he is, of course, dangerous.

The psychologic and psychiatric examinations are of great importance. When intelligence is rated below a certain level (I do not feel competent to give a definite level of the intelligence quotient at which this occurs), a driver is obviously not competent to drive no matter how well he may react mechanically. His judgment in an emergency has a much greater chance of being faulty than in the case of a normal person. In addition, we find that feebleminded persons have a much more antisocial attitude, owing to the fact that they are not able to note and assimilate in as efficient a fashion the reactions of others toward antisocial types of behavior. The attitude of an aggressive and dangerous driver may be caused by a certain inward mechanism, such as that described in the case of the subdued boy previously mentioned. Probably all young persons are aggressive and egocentric drivers, and only as they grow older are they able to comprehend the sociologic factors impinging on them which tend to mold this juvenile behavior into acceptable adult conduct.

In a previous paper [10] I cited cases of neurotic individuals who had compulsive tendencies to injure and maim father substitutes or persons challenging their egos. The same development of complex material which causes the neurosis may lie behind various kinds of traffic offenses; the man who has a deep oedipus complex may attempt to run down men in a safety zone because these men are father substitutes. This is particularly true in the case of policemen, who are definitely a symbol for law as manifested by the father. The anxiety neurosis has a somewhat similar cause, but the manifestation of the psychodynamics of the traffic offender with such a neurosis is likely to cause accidents because of his brooding, worries, distractibility and inadequate interest in the task at hand—driving. So individuals with a major neurosis should not be permitted to drive. On the other hand, since neuroses, as a rule, are curable, particularly in those cases in which medical help can be secured, such sufferers may, after a series of psychiatric treatments, be restored to the road.

The psychotic drivers have already been mentioned. It is obvious that no psychotic person should drive, but the presence of the condition can be elicited only by a psychiatric examination. In our experience with a highly selected group of more than a thousand offenders, about 4 per cent were found to be psychotic. Of course, since these persons were referred to us because of their bizarre conduct in court or at the time of arrest, the percentage is higher than that found in a random sample of the driving population.

10. Selling, Lowell S.: The Psychiatric Findings in the Cases of Five Hundred Traffic Offenders and Accident-Prone Drivers, Am. J. Psychiat. **97**: 68-79 (July) 1940.

CONCLUSION

Although the general educational procedures and clinical method of attacking traffic problems offer an obvious approach for mental hygiene, one can expect in the future to see the attack on the abnormal personalities expanded. With the increased development of school medicine and psychologic clinics attached to schools, there can be no valid reason for not detecting those who are physically and mentally incompetent to drive a car before they reach driving age. If they are treatable the process of treatment can be initiated to benefit both the potential driver and the general health of the community.

One obvious method which should be highly worth while is the proper education of the new drivers. It is to be hoped that those children who have gone through the schools and have already had extensive safety education will be better drivers as they reach driving age. With the establishment of formal courses to teach children properly to drive rather than allowing them to learn about driving by trial and error, as the older generations have, one can anticipate even greater success. Mental hygiene will enter into this situation immensely, for the interpersonal reactions of the driver depend on his emotional and mental adjustment toward himself and toward other people, and this, of course, lies in the field of mental hygiene.

To summarize then one can say that, while engineering and enforcement are important approaches to the elimination of traffic accidents, greater need, and perhaps greater hope, lies in the attack on the abnormal personality and in the dissemination of material for normal persons which will tend toward changed attitudes in the matter of driving. Mental hygiene in its aspects of public health education toward better thinking and of preventive psychiatry in the form of clinical treatment of persons with bizarre conduct has already demonstrated in our clinic that it is a useful life saving service.

Whether the basis of the attack on traffic problems should be in health departments of the various communities cannot immediately be determined, but certainly some unification of safety education is called for. In the light of the extensive experiences of health departments, national and local, in the field of health education, these organizations can definitely be considered as fulcrums for a unified and expanded mental health program for drivers.

ABSTRACT OF DISCUSSION

DR. DANIEL BLAIN, New York: There are more deaths due to this one form of accident than from typhoid, smallpox, measles, scarlet fever, whooping cough, diphtheria, erysipelas, meningitis, malaria, rheumatism and syphilis put together. This amounts to a serious epidemic, now chronic for twenty-seven years; yet the medical profession has been singularly uninterested. Faulty cars, alcohol, exhaustion, disease and age play a part. Certain accident-prone drivers are responsible for a large number of accidents. With due deference to all these causes, I should like to suggest the greatest menace to the eventual solution of the problem: the one-accident driver. Figures show that of 4,500,000 accidents of all kinds one third are due to accident-prone drivers. These I think may be said to be ill mentally or physically. That leaves 3,000,000 accidents, 600,000 injuries and 20,000 fatalities a year, presumably due to normal people, people perfectly capable of acting properly, who can see, hear, stop and steer the car but who at one time in all their comings and goings have an accident. This is a real major health problem, one not even scratched by existing plans, one barely mentioned in any publication. It is the one-accident driver who is the menace because there are so many of him. It is true that education tries to reach people in the mass, but where is the education that deals with people's emotions, their rivalries, competition, instincts, timidity, compulsion drives, absentmindedness, carelessness and, above all else, the deep laid gambling instinct, the willingness to take a chance, the belief in the magic of their own luck, the unwillingness to face the facts of their own chances of crashing sooner or later, the unconscious motive of aggression, revenge, the inner demand to hurry and pass everything, compensation for inferiority, or the Jehovah complex that "I am better than any one else and deserve the whole road," and so on? To conclude, the accident problem narrows down to finding, eliminating and preventing from driving a small group of high accident drivers, and the enormous task of influencing the great public who make up the mass of pedestrians and relatively normal drivers who contribute to the great percentage of accidents.

AN OUTBREAK OF DERMATITIS FROM NEW RESIN FABRIC FINISHES

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In March 1940 the Office of Dermatoses Investigations of the U. S. Public Health Service received a notification from Dr. Donald S. Mitchell, of Montreal, Canada, that there were many cases of dermatitis occurring in Canada on persons wearing cotton fabrics finished with a preparation made by a large American chemical manufacturing company. He asked whether we had a record of such cases occurring in the United States.

The manufacturers of the product were notified and they stated that they had no record of such cases in this country, despite the fact that they had sold it to many finishing factories. They also stated that they had performed patch tests on human beings with the material before they placed it on the market and that they had obtained no reactions. They further stated that the finish as sold by them was diluted with various other chemicals in the factory where the finishing was done before it was applied to the fabric, and they thought that the dermatitis might be caused by one of the chemicals added to the finish by the finishers.

The Office of Dermatoses Investigations requested that the chemical company send samples of their finish (a milky looking emulsion), and these samples were forwarded to Dr. Mitchell for patch testing his patients. He found that even though he diluted the finish with 99 parts of water, a piece of gauze dipped into it gave positive patch tests on his patients. The manufacturer of the finish was then requested to send samples of each of the ingredients used in the finish. Of these ingre-

dients xylene, dupinol (a wetting out agent and emulsifier) and an acid ester gum were suspected as the possible irritants, the other ingredients being inert substances, such as starch. The suspected chemicals were forwarded to Dr. Mitchell, who again patch tested his patients with these substances in the dilution in which they were contained in the finish. He obtained reactions only from the ester gum. Therefore it appears that this was the principal sensitizer in the finish, although traces of xylene remaining in the finish may also have played a part, producing sensitization by aiding the acid ester gum to penetrate the skin.

Ester gums are combinations of natural resins (such as rosin) with glycerin. They can be made by combining rosin with glycerin or directly from a combination of glycerin with the oleo resin. The principal ingredient of rosin is abietic acid, and the degree of neutralization of the abietic acid with the glycerin determines the acid number of the ester gum. Rosin was found to be the chief irritant in adhesive plaster,[1] and it is to be expected that an ester gum with a high acid number (containing uncombined abietic acid) if kept in contact with the skin will cause dermatitis in a manner similar to that caused by adhesive plaster.

While the investigation of the dermatitis in Canada was under way, reports were coming into the Office of Dermatoses Investigations of dermatitis occurring in Missouri and other parts of the United States from "shorts" sold in chain stores. The dermatitis was characterized by intense pruritus and covered most of the skin area touched by the shorts. In some cases the inflammation was so severe as to cause systemic symptoms and required hospitalization. In one case a circumcision was necessary to relieve the edema of the foreskin. A visit to the principal office of one chain store showed that it had put about 30,000 dozen of these shorts into its branch stores, but as soon as it received reports that these were causing dermatitis it recalled all those that were not sold, amounting to about 8,000 dozen. In the meantime it had received forty-eight complaints of dermatitis caused by the shorts, occurring in various parts of the country. Some of these were confirmed by positive patch tests with pieces of the shorts. The shorts consisted of cotton dyed in various combinations and finished. No one combination of colors was involved. The cases of dermatitis occurred from all the colors. An analysis of twenty-seven cases according to color and lot is given in table 1.

Although the dyes in these shorts bled when immersed in water, patch tests on the patients with the dyes and with the fabrics were negative, but patch tests with the finish were positive. Investigations showed that the fabrics in the shorts were all dyed and finished in one finishing plant, and inquiry at this plant revealed that the finish it used was purchased from the same company and was the same finish which caused the dermatitis occurring in Canada. This finish when applied undiluted to the shaved skin of rabbits produced a dermatitis within seventy-two hours.

While this investigation was going on, notice was received from South Carolina that dermatitis was occurring among the girls sewing and handling cotton fabrics manufactured in one of the South Carolina mills. Investigation at this mill showed that these fabrics were also treated with the same finish.

1. Schwartz, Louis, and Peck, Samuel: The Irritants in Adhesive Plaster, Pub. Health Rep. **50**: 811-819 (June 14) 1935, reprint 1690.

About this time one of us saw a case of generalized dermatitis (fig. 1) which was proved by patch test to have been caused by wearing new pajamas. In this case patch tests performed at different times with the finish extracted from the fabric and applied to a piece of white gauze, and with the finish causing the dermatitis in Canada applied to white gauze, all produced marked reactions and an exacerbation of a generalized dermatitis (figs. 2 and 3). Subsequent investigation revealed that the pajamas were finished with the same finish that caused the dermatitis in Canada.

About the same time reports began coming in of dermatitis occurring among women wearing hosiery made from a new synthetic fiber substitute for silk. The first of these reports was received on May 1 and came in the form of a query from a hosiery mill in Indiana, asking for whatever information the Public Health Service had on this matter. It was told that the finish was suspected and was asked to give the trade name or composition of the finish which it used. Reports of cases of dermatitis from hosiery made of the new synthetic fiber were then received by the Public Health Service from the following sources. All requested whatever information the Public Health Service had as to the actual cause of the dermatitis and they were all told that the Office of Dermatoses Investigations was investigating the matter and that the results pointed to the finish on the hose as the actual irritant.

TABLE 1.—*Twenty-Seven Cases of Dermatitis*

Finish, Pounds	Pattern	Total Pattern Complaints	Complaints by Colors		
			Blue	Brown	Green
80	6608	7	3	3	1
80	6741	2	..	..	2
80	6647	2	1	1	..
60	6126	2	..	..	2
60	6122	5	4	..	1
60	6124	1	1	..	..
60	6125	4	4	..	..
60	6123	2	1	1	..
60	6625	2	2	..	..
Totals		27	16	5	6

On June 22, Dr. Verne K. Harvey, director of the Indiana State Board of Health, reported thirty-eight cases.

On June 24, Dr. Adolph B. Loveman of Louisville, Ky., reported four cases.

On July 15, Dr. Frederick W. Birkman of New York reported one case.

On July 16, Dr. George Van Rhee of Detroit reported one case.

On July 22 Dr. S. J. Fanburg of Newark, N. J., reported four cases.

Investigations in Indiana, where the largest number of cases were reported, showed seventy-four known cases, of which number the authors actually saw sixty-four. In these cases the dermatitis began from two to twenty-eight days after the patient began wearing the stockings. The average case began two days after the stockings were worn. Some of the women wore the hose for only one or two days and then not again for two weeks. In these the dermatitis began within twenty-four hours after the hose were worn a second time. Sensitization in these cases was produced by previously wearing the hose.

The eruption usually began on the lower third and posterior aspect of the thighs as a small, brownish red papule around the hair follicle. It extended rapidly up the thighs to where the stocking ended and down

on the leg to the shoe top. In no case did it involve the foot. The pruritus was severe and the skin was erythematous, edematous and covered with brownish red macules and papules. Exposure to sunlight definitely aggravated the dermatitis and pruritus. When the wearing of the hosiery was discontinued, then under palliative, antipruritic treatment and sedatives the eruption faded and finally disappeared, but the pruritus persisted in some of the cases even after seven weeks. The follicles remained enlarged for a number of weeks after the eruption subsided.

Some of the patients developed urticarial and eczematous lesions on the trunk, arms, face, eyes and ears accompanied by such constitutional symptoms as headache, dizziness, elevated temperature, blurred vision, nausea and nervousness. Blood examinations made on two of the patients showed no significant changes.

Fig. 1.—Dermatitis caused by finish on pajamas.

Patch tests performed in thirteen of these sixty-four cases with pieces of the hose which were worn gave positive reactions in forty-eight hours. On two of these patients patch tests were performed with the diluted finish used on the hose and in both of them the reactions obtained were severe and the sites of previous patch tests with the hose again became active and the subsiding dermatitis flared up. In addition to this, one of the patients developed a generalized erythema multiforme and the other developed pruritus of the right side of the face and complained of severe pain in her head and blurred vision. Examination of the eyes, however, revealed nothing pathologic. All the patients patch tested showed marked sensitivity to the adhesive plaster.

Some of the patients who had recovered again bought hose made of the new synthetic silk but having a different finish, and they have continued wearing them without ill effects.

It was suspected by the Public Health Service that this outbreak of dermatitis from wearing the hose was caused by the same finish which caused the dermatitis from wearing cotton fabrics, and the investigation to discover the actual cause of these cases was undertaken.

The factory where the new synthetic thread is made was visited and the manufacturing process studied. The new synthetic fiber is a polymer made from hexamethylenediamine and adipic acid. It enters the plant in the form of the monomer, a water white solution in water. That the monomer is not a primary skin irritant is shown by the fact that the hands of one of us was immersed in it and allowed to dry, with no after-effects. The monomer is mixed with an inert delustering agent and an organic acid stabilizer and under heat and pressure is converted into the polymer. During the process of polymerization fugitive irritating compounds may be formed which appear for a short time in the unfinished fiber. They are said to disappear from the fiber during the remainder of the manufacturing process. The polymer, a milky white solid, is dried and cut into small chips. These chips are melted by heat and forced through minute openings to form a thread. The thread is cooled and solidified and a number of the fine threads are wetted with an emulsion and twisted into one thread. This emulsion consists of a vegetable oil, an organic solvent, a soap and an essential oil. There is only a fraction of 1 per cent by weight of the emulsion on the thread.

The thread is now stretched and twisted and then spooled. It is sold in this form but requires to be "thrown" before it can be used for knitting. Some of the thread is covered with a sizing consisting of a mixture of a polyvinyl compound and an innocuous hardening agent. It is then dried and oiled with a vegetable oil and wound on cones. These cones are sold to the hosiery mills and can be knitted without being "thrown."

The oil mixtures and sizing applied to the thread in the process of manufacture are supposedly removed in the hosiery mill by the "boil-off" operation. If the "boil-off" is imperfect, some of these oils and sizing may be left on the fiber and cause dermatitis in sensitive individuals.

It is a matter of record that, before the new synthetic fiber was put into large production, patch tests were performed with the unfinished thread on 200 people, with rayon and natural degummed silk as a control, and there were no greater number of positive reactions to the new synthetic fiber than to the control fabrics. In addition to this many thousand pairs of unfinished hose made of the new synthetic thread were given away for trial wear before it was placed on the market, and no cases of dermatitis occurred on the wearers. Samples of the new synthetic fiber in the various stages of manufacture were obtained at the factory for patch testing.

The state of Indiana, where the most cases of dermatitis were reported, was next visited. It was found that in all the confirmed cases of dermatitis hose manufactured in one mill had been worn. This was the mill which on May 1 reported the occurrence of cases to the Public Health Service. Chemical examination of thirty-six pairs of hose which had caused dermatitis on thirty patients showed that thirty-two pairs were made at this one mill and were all finished with the same finish. The other four pairs had been washed and there was not sufficient finish remaining on them to enable identification by chemical means.

The mill was visited and the manager interviewed. He stated that the manufacturers began making hosiery from the new synthetic fiber about one year ago and had sold many thousand dozen without receiving any complaints until April 1940. In April 1940 they began using a new finish and stated that they had sold about 1,000 dozen stockings finished with this product before they began to receive reports of dermatitis occurring from their hose. They then wrote to the Public Health

Service, and on receiving the reply stating that the finish should be suspected they stopped using it and succeeded in recalling from the retail stores about 300 dozen stockings. All the proved cases of dermatitis in Indiana were traced to stockings made in this one mill and

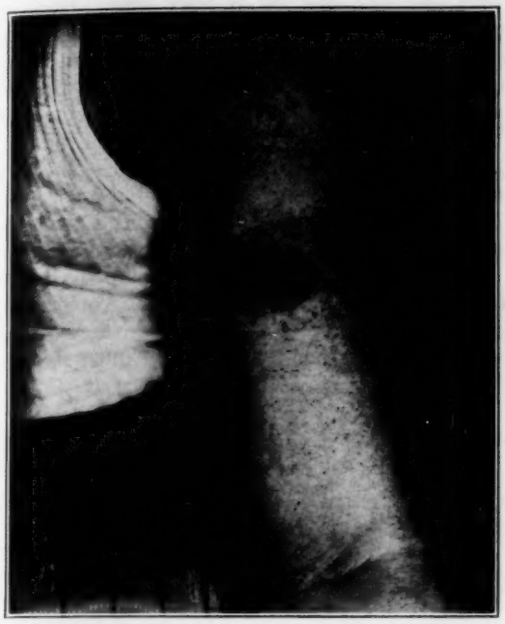

Fig. 2.—Patch test to finish taken off pajamas and applied to surgical aseptic gauze.

processed with the new finish. This finish proved to be the same as that which caused the dermatitis when used on cotton fabrics in Canada and elsewhere.

HOSIERY MANUFACTURING PROCESS

The cones of thread as brought from the new synthetic fiber factory are placed in knitting machines and knit into stocking legs. The thread as it comes off the cone passes through a lubricating emulsion before it is knit. The knit legs are taken to other machines, which knit and fasten the feet onto them. The thread in these machines passes through a similar emulsion to that used on the leg machines. The heels and toes are then looped together to close the foot. This is done on separate machines. The whole stocking is then seamed at the bottom of the foot and the back of the leg to form the closed stocking.

The stocking is then mounted on flat metal forms and placed in a chamber containing steam under pressure. This process, called "preboarding," softens the thermoplastic resin of which the thread is made and thus sets and shapes the hose. After the stockings come out of this steam chamber they are inspected for flaws by pulling and stretching over leg-shaped forms. They are then placed in cotton sacks, about four dozen to the sack, and taken to the dye house. The sacks are placed in metal drums and immersed and heated in about 50 gallons of a solution consisting of 2 per cent soap, 5 per cent wetting-out agent, 3 per cent trisodium phosphate (tetrasodium pyrophosphate may be used) and 10 per cent sulfonated castor oil containing dichlorethyl ether (the percentages given are on the weight of the stockings to be dyed). To this "boil-off" bath is also added the required amount of synthetic dyes to color the stockings. The dyes used are the same class as are used for acetate silk (acetamine and cellanthrene colors). The dyers state that the new synthetic fiber dyes better when the "boil-off" and the dyeing is done in one operation, but as far as the dermatitis hazard to the wearer is concerned it would be preferable to make one operation of the "boil-off" and empty the drums of the "boil-off" liquor before the dyeing solution is put in. The spent "boil-off" liquor when discharged would then remove all the oils and sizing which are used on the thread in order to facilitate knitting. As it is, these oils and sizings in the dye bath are likely to remain on the thread with the dye and are potential skin irritants.

After the operation of scouring and dyeing, the drum is drained and the stockings are given three rinses of water, after which the drum is again emptied and the solution of the finish is poured into the drum and applied to the hose. The finish now used and which was used previous to April 1940 is essentially an emulsion of a compound of a methylmethacrylate resin.

After the finish is applied, the stockings are placed in a centrifugal and the water extracted. The damp hose from the centrifugal are placed on hot metal forms to give them final shape, a process known as "boarding."

No cases of occupational dermatitis occurred in this mill among any of the workers handling the hose up to the "boarding" process. However, while the finish which caused the dermatitis was being used on the hose, one girl working at the "boarding" operation where she came in contact with the hot, damp finished stockings contracted an occupational dermatitis of her hands and arms which promptly cleared up when she was transferred to another operation. After "boarding," the hose are inspected, paired and packed. Samples of hose before the "boil-off" and dyeing, samples after dyeing, and samples after the finishing were obtained for patch testing.

Inspections at four other hosiery mills showed no material differences in the manufacuring process except that the finish causing the dermatitis had never been used in these mills, and one of the mills "boiled-off" and dyed in separate operations. The officials of two of these mills stated that they had had no reports of dermatitis from their new synthetic fiber stockings despite the fact that during the past year they had sold

Fig. 3.—Patch test to finish C diluted with 10 parts of water and applied to aseptic white gauze. Note flare-up of eruption.

more than 50,000 dozen pairs. In the third mill it was stated that two cases of dermatitis were reported as occurring from their hose during the year that they had been making the new synthetic fiber hose. One of these patients was seen by us and stated that she had itching but no eruption after wearing the hose. Patch tests performed on this patient by us showed a slight

reaction to the hose in that stage of manufacture after it came out of the "boil-off" and dyeing operation, but there was no reaction to a patch of new hose finished with the old finish (case 5, table 2). This seems to confirm the fact that by "boiling-off" and dyeing in one operation some of the oils and sizings are left on the hose and may cause dermatitis. In the fourth mill, where the suspected finish was not used, we were told that they had heard of only one case of dermatitis suspected to have been caused by their new synthetic fiber hose, although in the past year they had sold more than 20,000 dozen.

In an effort to discover the actual irritant that caused the dermatitis from wearing the new synthetic fiber hose, patch tests were performed on nine patients who were said to have had dermatitis from wearing them and who volunteered for these tests. Four of these had been definitely proved by one of the authors to have had dermatitis from wearing hose finished with the suspected finish. The proof consisted in positive patch tests to the hose which they wore and from which they claimed to have contracted dermatitis. The fifth was the one cited who reacted to the hose after the "boil-off" and dyeing operation but did not react to new hose finished with the old formula. The four other patients were women working in the mill where the stockings causing the dermatitis were made and who stated that they had developed dermatitis from wearing them but who were treated by the nurse in the mill and not seen by a physician. All nine patients had recovered by the time these patches were applied.

The patches applied for forty-eight hours were as follows:

1. New synthetic thread, unoiled and unsized as obtained from the factory making it.
2. New synthetic thread on the cone, oiled and sized as sold by the factory making it.
3. New synthetic fiber stockings after "preboarding."
4. New synthetic fiber stockings after "boil-off and dye."
5. New synthetic fiber stockings after being finished with the old finish and "boarded."
6. A piece of scoured and dyed new synthetic fiber stockings dipped in a solution consisting of 1 part of finish A and 9 parts of water.
7. Scoured and dyed new synthetic fiber hose dipped in a solution of 1 part of finish B and 9 parts of water.
8. Scoured and dyed new synthetic fiber hose dipped in a solution of 1 part of finish C and 9 parts of water.

Finish A consisted of an emulsion of paraffin in a wetting-out agent. This finish has been used on natural silk hose for many years. Finish B consisted of an emulsion of a compounded methylmethacrylate resin. It is the old finish which was used on the hose before dermatitis occurred and is again being used on the new synthetic fiber. Finish C is the finish which was proved to have caused dermatitis when it was used on cotton and which was the finish used on the batch of hose causing the dermatitis. It is an emulsion of an acid ester gum. Table 2 shows the results of the patch tests.

It will be noted that all of the four subjects who were proved by patch tests to have had dermatitis from the hose reacted markedly to patch 8, the hose finished with finish C. One of the proved cases gave a lesser reaction to finish B than to finish C and another gave lesser reactions to the hose in stages 3 and 4 of its manufacture and to finish A.

One of the two among the five unproved subjects who reacted to finish C also reacted to the other finishes but to a lesser degree and she also reacted to patches 1 and 2. The other three subjects gave no reactions and hence their dermatitis was probably not caused by the hose.

The tests show that while sensitization may occur in some individuals to the new synthetic fiber itself, to the sizing and the oils on it (we know from other investigations that eugenol, the essential oil used in the emulsion, is a sensitizer), to the emulsion used in the knitting, to the mixture in the "boil-off" and dyeing solutions (this contains all the oils and sizings previously used on the thread as well as strong alkalis and dyes) and to the other finishes, yet all of the six patients who reacted to any of the finishes reacted most strongly to finish C. This is the finish that was used on the batch of hosiery to which the outbreak of dermatitis was traced and is the same finish which was proved to have caused the outbreak of dermatitis from cotton fabrics. Three of the six who reacted to the finish reacted only to finish C, and the other three reacted most strongly to finish C. All the six who reacted to finish C reacted strongly to adhesive plaster, which also contains abietic acid, which we believe to be the irritant ingredient in the ester gum contained in finish C actually causing the dermatitis. Hence it can be said that, while dermatitis may be caused in sensitive persons by any of the finishes and even by many natural fabrics like wool and silk, yet the major cause of the outbreak of dermatitis from hose and other wearing apparel described in this paper was the use of finish C. Those persons who developed dermatitis a few days after wearing the stockings were probably already sensitive to the resin in the finish (perhaps they acquired this sensitivity by previous contact with adhesive plaster), while those who developed dermatitis ten days or more after wearing the hose were sensitized by the resin in the finish.

As a result of these investigations this finish is no longer recommended by its manufacturers for use on wearing apparel.

Finishes are placed on fabrics in order to give them a better appearance, a better feel and better wearing properties, and to prevent runs and make them noncreasing and sometimes to hold the crease. Their stay

TABLE 2.—*Results of Patch Tests*

	Patch								
Patient	1	2	3	4	5	6	7	8	Comment
Proved									
1	—	?	—	—	—	?	+	+++	Marked reaction to adhesive plaster
2	—	—	—	—	—	—	—	+	Marked reaction to adhesive plaster
3	—	—	—	—	—	—	—	++	Marked reaction to adhesive plaster
4	—	—	+	+	—	+	—	++	Marked reaction to adhesive plaster
Unproved									
5	—	—	—	+	—	—	—	—	
6	?	—	—	—	—	—	—	+	Marked reaction to adhesive plaster
7	—	—	—	—	—	—	—	—	
8	+	+	—	—	+	+	+	++	Marked reaction to adhesive plaster
9	?	—	—	—	?	—	—	—	
Positive reactions	1	1	1	2	1	2	2	6	

on the fabric is more or less temporary, for while part of the finish may remain after many washings the first laundering usually removes a large proportion of it. The fact that fabric finishes are often the causes of dermatitis when dyes are blamed was first proved by Schwartz.[2]

The sulfonated oils which were previously used as finishes have largely been supplanted by finishes made of various new synthetic resins. The urea formaldehyde resins, the alkyd resins, the methylmathacrylate resins and ester gums are used in modern finishes. Some of these resins are also used as vehicles for new types of fabric dyes. Recently fabrics have appeared on the market which are coated with resins containing antiseptics. These resins are often mixed with various plasticizers and stabilizers in order to give them the required properties necessary for use in wearing apparel. Resins are also used as plastic materials from which are manufactured such articles as belts, suspenders, wrist watch straps and garters.

Not only are the resins themselves capable of producing sensitization, but many of the plasticizers, stabilizers and antiseptics used in them are primary skin irritants as well as sensitizers.

Outbreaks of dermatitis caused by dyes, leather, rubber, plastics and fabrics in wearing apparel have often previously been reported. Manufacturers are placing materials containing new substances of unknown toxicologic properties on the market for wear before testing their action on the human skin. As a result there have been new outbreaks of dermatitis such as are described in this paper. Such outbreaks will continue to occur as long as this practice continues.

Therefore it is suggested that, before any new chemical or combination of chemicals is to be sold to the consumer for the purpose of wearing apparel or as a fabric finish or dye, the manufacturer should have toxicologic laboratories investigate the skin irritating and sensitizing properties of such new chemicals and make them known to their customers.

There should be standard tests for determining these facts. The following test is proposed: All new chemicals that may be used in wearing apparel should first be tested on susceptible animals (rabbits) to determine whether these chemicals are primary skin irritants. The test should consist in the application of the chemical to the shaved skin of a rabbit under a patch for twenty-four hours. Any irritation at the point of contact of the chemical with the skin is proof that the chemical is a primary skin irritant. If it is found that the chemical is not a primary skin irritant, it should be tested on animals for its sensitizing properties by applying it as a patch test for forty-eight hours ten days after the first series of patch tests. The manufacturer of the chemicals should make known to the customer the results of these tests.

Wearing apparel containing chemicals which have not been used before on fabrics should be first tested on ten or twelve persons to determine whether they are primary skin irritants or sensitizers. If it is found that the wearing apparel does not affect these people, a larger number (about 200) should be tested in the following manner: A piece of the new fabric should be applied in the form of a patch test for five days. As a control they should be patched at the same time with a fabric that has long previously been used for the purpose for which this new fabric is intended and has not caused an unusual amount of dermatitis. The new fabric should not cause any more reaction than does the old. Ten days after the removal of the first patches a second series of patches should be applied to the same individuals and allowed to remain on for two days. This should give an idea of the percentage of people who can be sensitized by the new fabric as against the percentage that can be sensitized by the old.

Five days is suggested as the length of time for the application of the first patch tests to this large group of people, because any ordinary fabric that will not irritate the skin can safely be permitted to remain on the skin for that period and because the period of incubation for sensitization is usually six or more days. Hence, sensitization reactions should not result during the period that the first patch test is allowed to remain on the skin. Ten days is allowed after the removal of the first series of patch tests before the second series is applied in order to permit sensitization to develop.

If such a series of experiments show that a greater percentage are sensitized by the new fabric than by the old, then it is more hazardous and should if possible be modified in order to make it less so. Or if this is not possible it should be discarded as unsafe.

In addition to these precautions it should be required that dyes, finishes, plasticizers, stabilizers, antioxidants and accelerators used on wearing apparel should be of such a nature or so incorporated into materials that they will not come off or out of the material under the action of a normal amount of perspiration.

To assist manufacturers and better to protect the general public, it is suggested that the conclusions of such toxicologic laboratories should be submitted to the state department of health and labor of those states having industrial hygiene units, which in turn could call on the Office of Dermatoses Investigations whenever needed.

We believe that if these suggestions, or similar ones, were carried out, not only would the public be safeguarded from outbreaks of dermatitis such as here described, but the retailers would be saved the annual loss of large sums of money.

SUMMARY

Seemingly separate outbreaks of dermatitis in the United States and Canada caused by wearing apparel made of different fabrics were investigated and found to be due to a common cause.

A certain finish used on these fabrics was proved to be the cause. This finish is essentially an emulsion of an acid ester gum.

The acid ester gum was proved to be the chief irritant.

As a result of these investigations the finish was withdrawn by its manufacturers for use on wearing apparel.

RECOMMENDATIONS

Manufacturers of chemicals should have toxicologic and dermatologic tests performed on their chemicals and acquaint the buyers with the results.

Manufacturers of wearing apparel containing new chemicals should have studies made of the effect of these chemicals on the skin before placing them on sale to the public.

A method has been devised for performing such skin studies.

It is recommended that the buyer launder all new underwear, stockings and other garments that touch the skin, before wearing.

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HYPERTENSION AND CHRONIC ATROPHIC PYELONEPHRITIS

RESULTS OF NEPHRECTOMY

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The experiments of Goldblatt [1] and others [2] who have shown that hypertension may be produced in dogs by partial constriction of the renal arteries by means of metal clamps have stimulated a more careful search for primary localized renal disease, particularly chronic pyelonephritis, in human beings with so-called essential hypertension. Although there is no evidence of chronic pyelonephritis in the majority of cases of essential hypertension, several investigators (Longcope,[3] Butler [4] and Weiss and Parker [5]) have felt that the association of these conditions was frequent enough to be more than incidental. Butler has reported a case in which hypertension was associated with unilateral chronic pyelonephritis in a child aged 7 years. Surgical removal of the affected kidney was followed by return of blood pressure to normal; the pressure had remained normal for twenty months at the time of Butler's report. Barney and Suby [6] have reported a similar result of nephrectomy for unilateral chronic pyelonephritis in a case of hypertension in which the patient was 10 years of age. Crabtree [7] has reported three cases in which nephrectomy was performed for chronic pyelonephritis or hydronephrosis associated with hypertension. The hypertension disappeared in all three cases; but in one case, in which there was disease in the remaining kidney, the hypertension recurred within a year. In a second case there was recurrence after the blood pressure had been normal for ten years. It also has been felt that localized vascular lesions of the kidney might be responsible for hypertension in rare instances. Leadbetter and Burkland [8] have reported relief of hypertension in a Negro boy following removal of an ectopic kidney in which the main artery was partially occluded. Boyd and Lewis [9] reported a similar effect after removal of a kidney containing multiple infarcts.

REPORT OF CASES

We report five cases of hypertension associated with unilateral chronic atrophic pyelonephritis in which nephrectomy resulted in return of the blood pressure to normal levels.

CASE 1 (A preliminary report has been published elsewhere [10]).—A man aged 42 came to the Mayo Clinic in November 1937. A large stone had been removed from his right ureter in 1933 elsewhere. At that time the kidney appeared to be of normal size in the urogram; in 1935 the kidney had been found to be moderately contracted; in 1937 it was markedly contracted. His blood pressure had been normal at numerous examinations prior to March 1936. In August 1937 his systolic blood pressure had been 200 mm. of mercury and the diastolic pressure 140. He stated that there was no known hypertension in his family.

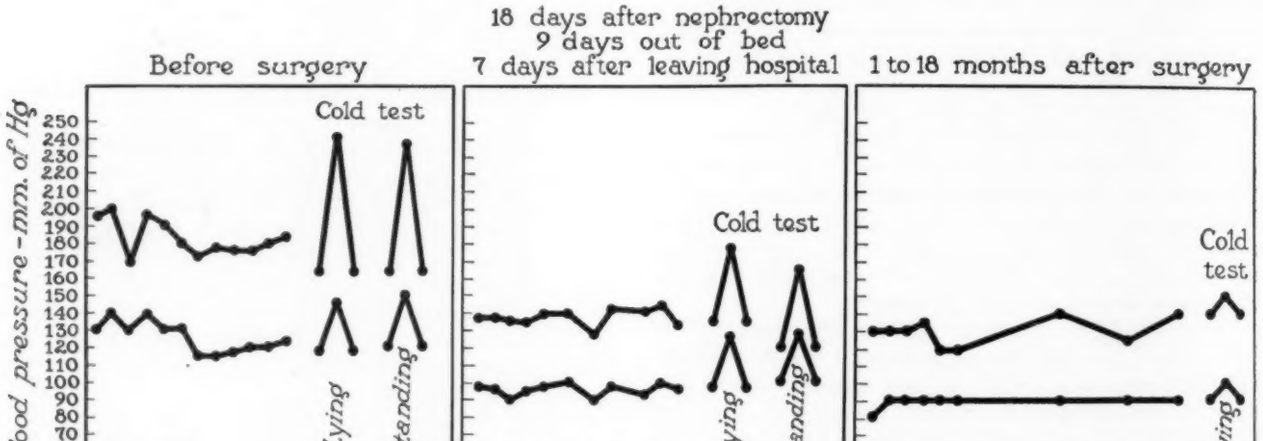

Fig. 1.—Hourly blood pressures taken with patient at rest, reactions to cold pressor test and follow-up studies in case 1 before and after nephrectomy.

In November 1937 the first blood pressure was 232 mm. systolic and 135 diastolic. Examination disclosed slight sclerosis and moderate narrowing of the retinal arteries and scattered small retinal hemorrhages. Retinal exudates and edema of the optic disks were not present. Chemical examination of the urine on several occasions did not disclose albumin or sugar, but microscopic examination showed hematuria grade 1 and pyuria grade 3. A roentgenogram of the thorax revealed that the transverse diameter of the heart was 11.5 cm. The electrocardiogram showed only left ventricular preponderance. The concentration of blood urea was 34 mg. per hundred cubic centimeters and that of serum sulfates 3.9 mg. per hundred

From the Division of Medicine (Dr. Barker) and the Division of Surgery (Dr. Walters), the Mayo Clinic.

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4. Butler, A. M.: Chronic Pyelonephritis and Arterial Hypertension, J. Clin. Investigation **16:** 889-897 (Nov.) 1937.

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8. Leadbetter, W. F., and Burkland, C. E.: Hypertension in Unilateral Renal Disease, J. Urol. **39:** 611-626 (May) 1938.

9. Boyd, C. H., and Lewis, L. G.: Nephrectomy for Arterial Hypertension, J. Urol. **39:** 627-635 (May) 1938.

10. Barker, N. W., and Walters, Waltman: Hypertension Associated with Unilateral Chronic Atrophic Pyelonephritis: Treatment by Nephrectomy, Proc. Staff Meet., Mayo Clin. **13:** 118-121 (Feb. 23) 1938.

cubic centimeters. Excretory urography disclosed marked contraction and distortion of the right kidney and slight dilatation of its pelvis and calices but showed only moderate reduction of renal function (fig. 2). The left kidney appeared entirely normal. Ureteral catheterization revealed an impassable stricture in the upper part of the right ureter. Excretion of indigo

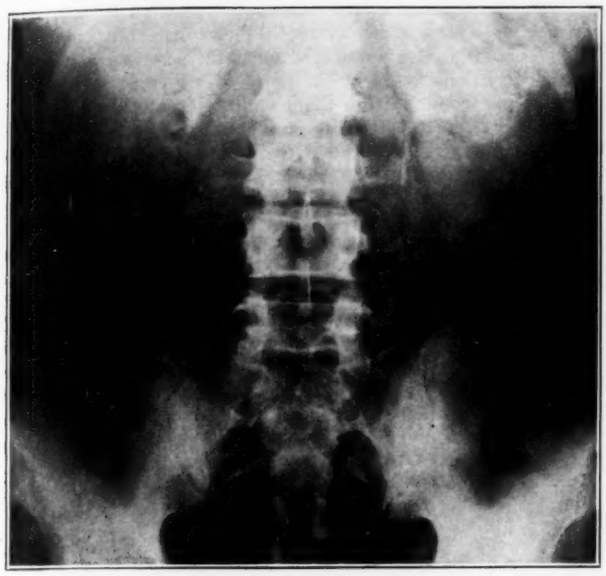

Fig. 2.—Excretory urogram in case 1, showing marked contraction of the right kidney.

carmine was grade 3 plus in the urine from the left kidney and grade 2 in the urine from the right kidney. A few leukocytes were found in the urine from the right kidney but none were found in that from the left kidney. Organisms were not obtained on culture of urine obtained by ureteral catheterization from either kidney, but Escherichia coli, micrococci and Pseudomonas were obtained from vesical urine.

The right kidney was removed Nov. 19, 1937; it was approximately a third of the normal size and weighed 48 Gm. (fig. 3). Its surface was nodular and contained numerous projections from a few millimeters to 1 cm. in diameter. The histologic picture was typical of chronic atrophic pyelonephritis. Slight dilatation of the pelvis and some thickening of the pelvic mucosa were present but there was no evidence of acute inflammatory reaction. Stones were not found. The cortex of the kidney consisted of alternate portions of normal renal tissue interspersed with portions of equal size in which the parenchyma had been destroyed almost completely and replaced by fibrous tissue containing numerous lymphocytes and fibroblasts. The arcuate and interlobular arteries in these portions had markedly thickened walls mostly as the result of intimal proliferation. Arteries with a lumen-to-wall ratio greater than 1:1 were not seen. In many of the arteries this ratio was reduced to 1:5 to 1:6 and the lumen of some of the arteries was completely obliterated (fig. 4).

The hourly readings of the blood pressure taken with the patient at rest and the responses of blood pressure to the cold pressor test before operation and eighteen days after operation are shown in figure 1. After the postoperative convalescence, roentgenograms of the heart and the electrocardiograms were unchanged. Examination of the ocular fundi disclosed only slight sclerosis and narrowing of the retinal arteries. The hemorrhages had disappeared.

Numerous determinations of the blood pressure were made during the next eighteen months. The average reading was 130 systolic, 90 diastolic and the maximal was 140 systolic, 100 diastolic, during this period. At the end of eighteen months the cold pressor test raised the blood pressure to only 150 systolic, 100 diastolic. At the end of two years the blood pressure was 130 systolic, 90 diastolic.

CASE 2.—A man aged 46 came to the clinic in February 1939; his chief complaint was headache of two months' duration. The headache had occurred chiefly when he awoke each morning and at times had been very severe and had lasted all day. Acetylsalicylic acid had not relieved the headache and he had found it necessary to take codeine many times for relief. One week before the headaches had begun he had had painless hematuria. Cystoscopic examination at that time had revealed a stone in the right kidney. He had been a patient at the clinic in 1931 because of gastrojejunal ulcer, for which a gastric resection had been done. At that time his blood pressure had been 116 systolic, 90 diastolic and 120 systolic, 90 diastolic on two occasions. He stated that it had been taken several times at the recent cystoscopic examination and had been pronounced normal. He did not know of any instances of hypertension in his family.

Examination revealed that his blood pressure was 178 systolic, 118 diastolic. Examination of the retinal arteries showed narrowing grade 1 plus and sclerosis grade 1. There was no retinitis. No enlargement of the heart was noted on physical or roentgenographic examination. The maximal specific gravity of the urine was 1.025. Albuminuria and glycosuria were not present. A few erythrocytes and a moderate number of leukocytes were found in the urine. The concentration of urea was 20 mg. per hundred cubic centimeters of blood. Excretory urography showed the left kidney to be normal and to have normal function. The right kidney excreted the medium only slightly at the end of twenty minutes. It was small and atrophic and its pelvis was filled with a large branched stone (fig. 5).

The right kidney was removed Feb. 21, 1939; it weighed only 70 Gm. and contained a stag-horn calculus which filled its pelvis. It was estimated that 50 per cent of the renal parenchyma had been destroyed by irregular pyelonephritic scarring. There was marked thickening of the walls of all arteries and arterioles in the scarred regions. The lumen-to-wall ratio varied from 1:2 and 1:5 (fig. 6).

The blood pressure readings determined hourly before and after operation and the response of the blood pressure to the cold test are shown in figure 7. When the patient was seen in

Fig. 3.—Appearance of right kidney in case 1, showing marked irregularity and scarring of the cortex and increase in the peripelvic fat.

the office six months after the operation his blood pressure was 120 systolic, 85 diastolic. He said that he had not had any headache since the operation.

CASE 3.—A married woman aged 34, who never had been pregnant, came to the clinic complaining of left renal colic which had occurred once or twice a year for ten years. To her knowledge she had not passed stones or had hematuria, chills or fever with the attacks. For a year and a half before

she came to the clinic she had had dull frontal headache about once a month. Her blood pressure had been found to be normal at examinations ten and four years previously. She did not know of any members of her family who had had hypertension.

Examination revealed moderate spasm and tortuosity of the retinal arteries with slight sclerosis. There was no evidence of retinitis or demonstrable enlargement of the heart. Pelvic

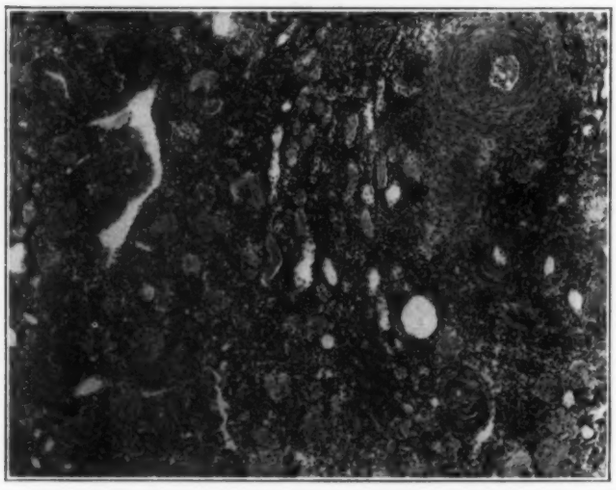

Fig. 4.—Section of kidney in case 1 showing marked destruction of the renal parenchyma with replacement by chronic inflammatory tissue, and marked thickening of the walls of the arteries and reduction in the size of their lumens; slightly reduced from a photomicrograph with a magnification of 50 diameters.

examination disclosed a movable firm tumor which extended 10 cm. above the symphysis pubis. This was believed to be a fibromyoma of the uterus.

Examination of the urine showed albuminuria grade 2 on a basis of 1 to 4; otherwise, the urine was normal. A roentgenogram of the thorax and an electrocardiogram did not reveal anything abnormal. The concentration of blood urea was 30 mg. per hundred cubic centimeters. Intravenous urography revealed a functionless left kidney and slight pyelectasis and caliectasis of the right kidney, which was functioning normally and was normal in size. Retrograde pyelography revealed a markedly contracted left kidney with a medially displaced pelvis.

The blood pressure on admission was 200 systolic, 126 diastolic. When taken hourly during a period of rest in the hospital it varied between 195 systolic, 125 diastolic and 160 systolic, 105 diastolic. The maximal response of the blood pressure to the cold pressor test was 190 systolic, 150 diastolic and the minimal blood pressure after anesthesia with pentothal sodium administered intravenously was 130 systolic, 95 diastolic.

The left kidney was removed. Twelve days later the blood pressure varied between 120 systolic, 85 diastolic, and 110 systolic, 75 diastolic, and on dismissal eighteen days after operation it was 130 systolic, 90 diastolic.

When the patient was reexamined one year later she had no complaints. Her blood pressure varied between 130 systolic, 100 diastolic and 125 systolic, 85 diastolic, and urinalysis did not reveal any abnormality. The concentration of blood urea was 38 mg. per hundred cubic centimeters and there was no spasm of the retinal arteries.

The left kidney weighed 18 Gm. (fig. 8). There was very little normal renal parenchyma remaining and for the most part the tissue consisted of extensive scars with remnants of destroyed tubules and hyalinized glomeruli. The arteries and arterioles in the scarred regions showed marked thickening of the wall and reduction of the lumen as the result of intimal proliferation in most instances.

CASE 4.—A housewife aged 52 came to the clinic because of persistent dull pain in the right side of the upper part of the abdomen. The pain had been associated with lumbar backache and had been present for two months. The patient had not menstruated for ten years. She had had severe periodic headaches for more than thirty years. Two months prior to coming to the clinic she had been told that her blood pressure was elevated. It had not been taken previously to this time. She stated that one sister had high blood pressure.

Examination revealed moderate narrowing and slight but definite sclerosis of the retinal arteries without retinitis. Examination of a specimen of urine which was obtained by catheterization revealed a trace of albumin and numerous pus corpuscles. The concentration of blood urea was 24 mg. per hundred cubic centimeters. Roentgenologic examination of the thorax revealed that the transverse diameter of the heart was 11.5 cm. Intravenous urography revealed an apparently normal left kidney and a functionless right kidney. Cystoscopic examination revealed pus coming from the right ureter and an impassable obstruction 2 to 3 cm. from the ureterovesical juncture. Culture of the vesical urine produced Escherichia coli. When the patient was first examined at the clinic her blood pressure was 186 systolic, 110 diastolic.

The right kidney was removed. Following the operation the blood pressure rapidly fell to 125 systolic, 70 diastolic. When the patient returned for a checkup ten months later her blood pressure was 125 systolic, 85 diastolic. At a second checkup thirteen months after operation her blood pressure was 128 systolic, 90 diastolic. The kidney weighed 52 Gm. Approximately 90 per cent of the renal parenchyma had been destroyed and replaced by chronic inflammatory fibrous tissue. In the involved regions there was marked thickening of the arteriolar walls, which was chiefly the result of proliferation of the intima.

The following case is presented only as a preliminary report, as insufficient time has elapsed since nephrectomy was done to permit of proper evaluation. However, since malignant hypertension with severe retinitis and edema of the optic disks is uncommon among children and since a return of blood pressure to normal with involution of the retinitis followed nephrectomy, a preliminary report of this case seems justified.

CASE 5.—A girl aged 7 years was brought to the clinic by her mother because of headaches. She had had occasional headaches since the age of 2 years, but these had increased

Fig. 5.—Excretory urogram in case 2, showing marked contraction of the right kidney.

markedly in frequency and severity during the past nine months and particularly during the past three months. Nine months previously she had had measles of severe degree. At that time albumin had been found in the urine and her systolic blood pressure had been found to be 180 mm. For the past five weeks her mother had noticed that the right eye turned inward.

Examination of the eyes showed definite weakness of the right external rectus muscle, marked spasm of the retinal

arteries, extensive retinal exudates and hemorrhages, and edema of the optic disks measuring from 5 to 6 diopters in both eyes. Her heart was definitely enlarged. Urinalysis showed albuminuria grade 2 on the basis of 1 to 4 but the urine was otherwise normal. Roentgenologic examination of the thorax showed apparent dilatation and torsion of the arch of the aorta with prominence of the aortic knob along the left border of the mediastinum. Normal pulsations were present in the arteries of the lower extremities. Her blood pressure on admission was 210 systolic, 160 diastolic. During a period of rest in the hospital the blood pressure varied between 210 systolic, 166 diastolic, and 170 systolic, 140 diastolic. The mean pressure was 207 systolic, 147 diastolic. The cold pressor test increased the blood pressure to 234 systolic, 176 diastolic. No history could be obtained which suggested any localized renal disease but an excretory urogram showed no evidence of secretion from the left kidney. A retrograde pyelogram showed that the left kidney was very small and had abbreviated clubbed calices. The right kidney appeared to be normal in the urograms and its function was normal. The left kidney was removed. The kidney was very small, weighing only 9 Gm. The pelvis was somewhat dilated and there was an anomalous artery crossing the ureteropelvic juncture. Microscopic examination showed marked destruction of the tubules throughout most of the kidney substance and hyalinization of almost all the glomeruli. There

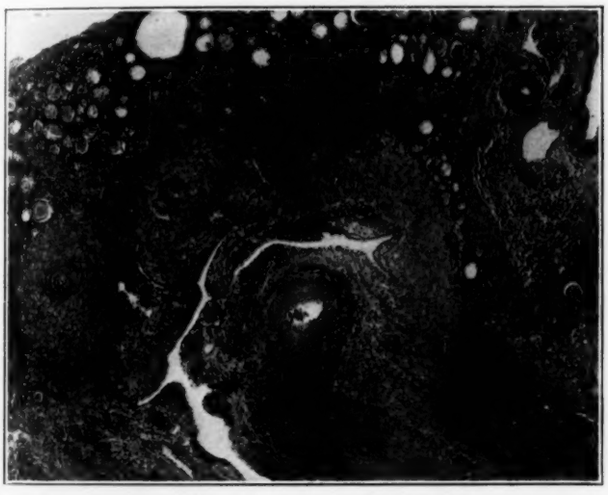

Fig. 6.—Section of kidney in case 2, showing marked destruction of the renal parenchyma with replacement by chronic inflammatory tissue and marked thickening of the walls of the arteries and reduction in the size of their lumens; slightly reduced from a photomicrograph with a magnification of 40 diameters.

was extreme thickening of the walls of the blood vessels, the lumens of which were practically obliterated in many instances. The patient's postoperative convalescence was uneventful. Her blood pressure gradually fell until on the sixth postoperative day it was 130 systolic, 104 diastolic. From the eleventh to the twentieth postoperative day it varied between 100 systolic, 80 diastolic, and 120 systolic, 90 diastolic. The cold pressor test on the twentieth postoperative day showed that the maximal blood pressure was 140 systolic, 104 diastolic. Examination of the retinas on this day also showed a few absorbing exudates but no hemorrhages. There was no arterial spasm and there was a marked reduction in the edema of the optic disks to 2 diopters. The weakness of the right external rectus muscle had entirely disappeared.

At a checkup three months after nephrectomy her blood pressure varied between 102 systolic, 70 diastolic and 122 systolic, 84 diastolic and did not rise at all during the cold pressor test. There was no edema of the optic disks but a few residual exudates were present in the retinas. Follow-up studies of this patient will be reported at a later date.

COMMENT

It is our opinion that in these five cases the return of the blood pressure to normal levels and its persistence at normal levels following nephrectomy is ample evidence that the diseased kidney was the chief factor in the production of the hypertension. In the first three cases it can be said with reasonable certainty that the renal disease was advanced when the hypertension first developed. In the fourth and fifth cases it is not known definitely when either the hypertension or the renal disease began.

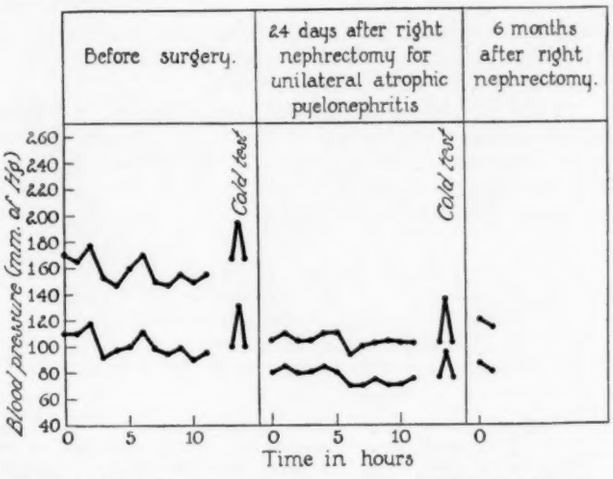

Fig. 7.—Hourly blood pressure taken at rest, reactions to cold pressor test and follow-up studies in case 2 before and after nephrectomy.

With regard to the hypertension, certain common characteristics were noted in all of the cases. None of the patients had evidence of advanced organic arterial damage, and in those cases (cases 1, 2 and 3) in which there were some data regarding the duration of the hypertension it had not existed for a long period. All

Fig. 8.—Kidney in case 3, showing marked atrophy of the parenchyma, pyelectasis and caliectasis.

the patients had relatively high diastolic blood pressures compared with the systolic.

With regard to the renal disease, all had contracted atrophic kidneys weighing less than 75 Gm. (that is, less than half the normal weight), all had extensive chronic pyelonephritis with destruction of renal parenchyma and all had marked thickening of the arterial walls in the scarred regions.

Similar observations were made in one of the cases reported by Butler. In their study of pyelonephritis and hypertension, Weiss and Parker stated that a mild degree of hyperplastic arteriolar sclerosis in both kidneys is usually associated with normal blood pressure, a severe degree of hyperplastic arteriolar sclerosis in unilateral pyelonephritis may or may not be associated with hypertension, and a severe degree of hyperplastic arteriolar sclerosis in both kidneys is practically always associated with severe hypertension.

In the five cases which we have reported, the cause of the marked thickening of the renal arteries has not been determined. The arteries in the regions in which the renal parenchyma was well preserved appeared to be normal. The thickening was not confined to the arterioles but was also seen in the interlobular and arcuate arteries. It was partly due to increased thickening of the muscular coat and partly to extensive hyperplasia of the intima. There are three possibilities: (1) The arteries may be thickened as the result of arteritis which is part of the chronic inflammatory reaction in the renal parenchyma, (2) they may be thickened as the result of contraction by the scar tissue, and (3) they may be thickened because of more distal obstruction to the capillaries associated with the destruction of the renal parenchyma. As the scarred regions containing the thickened arteries comprised a large portion of the renal tissue in each case, there can be no doubt that in each case there was considerable obstruction to the renal arterial blood flow.

Blood Pressure When Patients Were First Observed at the Clinic and Pathologic Changes in Cases of Unilateral Chronic Atrophic Pyelonephritis in Which Nephrectomy Was Performed

Case	Age, Yrs.; Sex	Blood Pressure, Mm. of Mercury	Weight of Kidney, Gm.	Renal Lesions and Percentage of Renal Parenchyma Involved by Scar Tissue	Thickening of Arterial Walls, Grade*
1	42, ♂	232/135	48	Nodular chronic pyelonephritis; 50%	3+
2	46, ♂	178/118	70	Nodular chronic pyelonephritis; large stone; 50%	3+
3	34, ♀	200/126	18	Diffuse chronic pyelonephritis; very little normal parenchyma	3+
4	52, ♀	186/110	52	Chronic nodular pyelonephritis; thickened parenchyma; 60%	4
5	7, ♀	210/ 66	9	Diffuse chronic pyelonephritis; many hyaline glomeruli	3
6	44, ♀	200/130	50	Granular chronic pyelonephritis; 60%	3+
7	43, ♀	170/112	30	Nodular chronic pyelonephritis; 60%	3+
8	57, ♂	184/112	50	Nodular chronic pyelonephritis; 30%	3+
9	47, ♀	170/100	70	Nodular chronic pyelonephritis; 40%	3+
10	39, ♀	250/140	60	Nodular chronic pyelonephritis; 50%	3+
11	36, ♀	220/130	20	Diffuse chronic pyelonephritis	3+
12	47, ♂	152/102	70	Nodular chronic pyelonephritis; 20%	3
13	37, ♀	160/ 88	70	Nodular chronic pyelonephritis; 10%	1+
14	48, ♀	162/ 88	48	Nodular chronic pyelonephritis; 50%	3+
15	49, ♀	155/ 90	60	Nodular chronic pyelonephritis; 40%	3+
16	26, ♀	125/ 90	42	Small hydronephrotic sac with diffuse chronic pyelonephritis	3
17	21, ♀	128/ 92	44	Nodular chronic pyelonephritis; 50%	3+
18	10, ♀	100/ 50	25	Nodular chronic pyelonephritis; 50%	3
19	39, ♀	130/ 90	68	Chronic pyelonephritis with pyonephrosis	3
20	50, ♂	110/ 74	52	Chronic pyelonephritis with pyonephrosis	3
21	41, ♂	124/ 86	70	Small hydronephrosis with a few scars	2
22	25, ♂	104/ 70	40	Small hydronephrotic sac with chronic pyelonephritis	2
23	52, ♀	118/ 74	45	Nodular chronic pyelonephritis; 40%	2
24	44, ♂	110/ 70	48	Nodular chronic and subacute pyelonephritis; 40%	2

* Basis of 1 to 4.

Because of the similarity of the renal lesions in the five cases it was thought advisable to study the incidence of hypertension in a larger series of cases of chronic atrophic pyelonephritis. A review of a consecutive series of fifty-seven cases in which a diagnosis of chronic atrophic pyelonephritis was made by urographic examination disclosed that twenty-six (45.6 per cent) of the patients had a blood pressure greater than 145 systolic, 90 diastolic.

We next studied a consecutive series of twenty-four cases in which pathologic examination of a kidney that was removed at operation revealed the presence of chronic atrophic pyelonephritis and a kidney that weighed less than 75 Gm.

The blood pressures in these cases were reviewed and careful pathologic studies of the kidneys were made. A summary of the data is given in the accompanying table. The first five cases are those which we have reported in detail.

It will be noted that the blood pressures in excess of 145 systolic, 90 diastolic, were found in fifteen, or 62.5 per cent, of the cases and that the first eleven (45.8 per cent) can be said to have had a definite hypertension. We have no follow-up data at the present time on the effect of nephrectomy on the blood pressure in cases 6, 7, 8 and 9. In cases 10 and 11 the blood pressures a year after operation were 130 systolic, 110 diastolic, and 145 systolic, 80 diastolic, respectively, but in each case an extensive sympathectomy was done at the time of nephrectomy, so that we cannot say that the lowering of the blood pressure was the result of nephrectomy alone.

It is also noteworthy that in all of the cases with definite hypertension there was marked thickening of the arteries in the scarred regions of the kidneys but that only moderate thickening of these arteries was found in four of the nine cases in which the blood pressure was normal. In the other five cases in which the blood pressure was normal there was marked thickening of the arteries, but in two of the cases there was also extensive suppuration of the kidneys (pyonephrosis) and the other three patients were relatively young individuals as compared with the patients who had definite hypertension.

It must be emphasized again that localized renal lesions are not commonly found in cases of so-called essential hypertension. Thus, in 100 cases of hypertension in which blood pressure studies were conducted in the hospital and in which urograms had been made, chronic atrophic pyelonephritis was found in only four. Further urographic studies in a large series of cases of hypertension and studies of the effect of nephrectomy for other types of renal lesion as well as chronic atrophic pyelonephritis are advisable.

SUMMARY

This paper is based on five cases of unilateral chronic atrophic pyelonephritis associated with hypertension. In each case the blood pressure returned to normal after nephrectomy and it has remained within normal limits for a number of months in four cases. Insufficient time has elapsed to evaluate thoroughly the fifth case. In each case pathologic studies revealed extensive atrophy and scarring of the diseased kidney with marked thickening of the walls of arteries in the scarred portions.

In twenty-six, or 45.6 per cent, of a series of fifty-seven cases in which a diagnosis of chronic atrophic pyelonephritis was made urographically there was an elevation of blood pressure. In a series of twenty-four cases in which chronic atrophic pyelonephritis was diagnosed pathologically after nephrectomy fifteen, or 62.5 per cent, showed an elevated blood pressure and eleven, or 45.8 per cent, definite hypertension.

There is evidence to believe that the hypertension is the result of obstruction of the renal arteries.

TREATMENT OF PNEUMOCOCCIC MENINGITIS

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Although the newer chemotherapeutic agents have not changed the outlook in pneumococcic meningitis as strikingly as in streptococcic meningitis, their use, together with specific serum, has made the prognosis much more hopeful in this highly fatal disease. In the past three years there have been several reports of small groups of cases or single cases in which recovery appears to have resulted from these agents, used alone or in combination.[1]

Prior to July 1938 only one of us had observed a recovery in pneumococcic meningitis. Between 1912 and 1937 there had been two recoveries at Cook County Contagious Hospital. Perusal of the medical literature confirmed the impression that prior to 1937 this disease had been almost invariably fatal.[2]

From July 1, 1938, to Feb. 1, 1940, we treated twenty-two patients, seven of whom recovered. Only the cases in which recovery occurred are described in detail in this communication, but to determine the relative frequency a survey was made of all cases of pneumococcic meningitis at the Cook County Hospital from Jan. 1, 1937, to Feb. 1, 1940. To our surprise there were seventy-one cases during this period. Among all the cases of meningitis at the Cook County Hospital, only tubercle bacilli and meningococci were ahead of pneumococci numerically as etiologic agents (table 1).

Surprisingly, during the twenty month period in which our twenty-two cases occurred, there were altogether thirty-eight cases of pneumococcic meningitis in the hospital, while only thirteen cases of meningococcic meningitis were admitted. Obviously the old teaching that all patients with purulent meningitis should be treated as having meningococcic meningitis until proved otherwise is entirely obsolete. Now it is best to start sulfapyridine or its sodium salt when in doubt, unless there are unusual contraindications. Every effort must be made to establish an etiologic diagnosis quickly so that other proper specific measures may be used. Six times among the thirty-three patients treated prior to our series antimeningococcus serum was given to patients with pneumococcic meningitis under a mistaken diagnosis. In our own series of fatal cases, one patient had been treated in this way prior to the time he came to us, and we mistakenly treated the patient for meningococcic meningitis for two days before the etiologic agent was determined.

Table 2, giving the results of a survey of all cases of pneumococcic meningitis in a three year period at the Cook County Hospital, shows the wide variety of pneumococcus types responsible for meningitis. In the cases reviewed (table 3), it is seen that pneumococcic meningitis, unassociated with other lesions, i. e. "primary," is relatively uncommon. Pneumonia, both confluent lobular and lobar, was the lesion most frequently associated with pneumococcic meningitis. Usually this preceded the meningitis but was in some instances undoubtedly a sequel. Otitis media was the next most common associated pathologic change and when present was usually the atrium of infection, although in four cases both otitis media and pneumonia were present. Four cases of pneumococcic meningitis occurred in persons with old healed skull fractures. It is doubtful whether there was any etiologic relationship in these cases, but in the three cases associated with recent skull fractures the atrium of infection may have been the torn dura.

We have been impressed with the studies of Osgood,[3] Branham and Rosenthal,[4] Gross and his associates,[5] and others in which more and more evidence has been adduced that the therapeutic efficacy of specific antibody, as well as of sulfanilamide or of sulfapyridine, was enhanced by the use of the two simultaneously. In their studies this action was beyond that which would be expected from the simple additive effect of the two. Hence our plan was to use both sulfapyridine and specific antiserum if the type of pneumococcus could be obtained quickly and serum could be obtained.

The protocols reveal that sulfanilamide was used in our earlier cases, then sulfapyridine and later the sodium salt of sulfapyridine. The Lederle Laboratories

From the Cook County Contagious Hospital.

1. In addition to the references given in footnote 2, these reports include the following:
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Young, Freida: Pneumococcic Meningitis Treated with Sulfanilamide: Recovery, Brit. M. J. **2:** 286 (Aug. 6) 1938.
Allen, W. B.; Mayer, S., and Williams, R.: Pneumococcic Meningitis with Recovery: A Report of Three Cases, Am. J. M. Sc. **196:** 99 (July) 1938.
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Garfin, S. W.: Meningitis (Otitis) Due to Type III Pneumococcus: Operation, Sulfanilamide and Intraspinal Injection of Patient's Own Serum; Recovery, Laryngoscope **48:** 797 (Nov.) 1938.
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Stein, J. L., and Steiner, M. M.: Meningitis Caused by Pneumococcus Type III: Observations on Sulfanilamide Therapy, Am. J. Dis. Child. **58:** 274 (Aug.) 1939.
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Sappington, S. W., and Favorite, G. O.: Sulfanilamide and Meningitis, Ann. Int. Med. **13:** 576 (Oct.) 1939.
Marriott, H. L.: Sulfapyridine (M. & B. 693) and Pneumococcic Infections, Brit. M. J. **2:** 944 (Nov. 11) 1939.

2. Neal, Josephine B.: Treatment of Infections of the Central Nervous System with Sulfanilamide, J. A. M. A. **111:** 1353 (Oct. 8) 1938. Eley, R. C., in discussion on Dr. Neal's paper. Finland, Maxwell; Brown, J. W., and Rauh, A. T.: Treatment of Pneumococcic Meningitis, New England J. Med. **218:** 1033 (June 23) 1938. Tripoli, C. J.: Bacterial Meningitis: Comparative Study of Various Therapeutic Measures, J. A. M. A. **106:** 171 (Jan. 18) 1936.

3. Osgood, E. E.: Culture of Human Marrow: Studies on Mode of Action of Sulfanilamide, J. A. M. A. **110:** 349 (Jan. 28) 1938.

4. Branham, S. E., and Rosenthal, S. M.: Studies in Chemotherapy: V. Sulfanilamide, Serum and Combined Drug and Serum Therapy in Experimental Meningococcic and Pneumococcic Infections in Mice, Pub. Health Rep. **52:** 685 (May 28) 1937.

5. Gross, Paul; Cooper, F. B.; and Lewis, Marion: The Chemotherapy of Experimental Type II Pneumococcic Meningitis, Am. J. M. Sc. **197:** 609 (May) 1939.

furnished us with the serum, and for eight patients in our series sulfapyridine was given to us by Merck & Co., Inc.

Although frequent determinations of the blood level of sulfanilamide and of sulfapyridine were not made in our earlier cases, the value of this check soon became apparent. As pointed out by other workers, the spinal fluid concentration of these drugs seldom exceeds more than one half to two thirds the blood concentration in persons under treatment. Hence a blood level of from 15 to 20 mg. per hundred cubic centimeters is desirable. In practically every case there was marked cyanosis after sulfanilamide or sulfapyridine was started, but this was not considered an indication for stopping the drugs. In some of the sulfanilamide-treated cases secondary anemia supervened but was treated by blood transfusion rather than by withdrawal of the drug. No noticeable effect on the blood was observed with the use of sulfapyridine. In our small series of sulfapyridine-treated cases hematuria did not occur. There were no instances of anaphylactic shock. In a few instances the sharp thermal reaction so often produced by rabbit serum occurred. It always responded promptly to intravenous administration of calcium, and in no case was it necessary to discontinue intravenous serum.

TABLE 1.—*Relative Frequency of Pneumococcic Meningitis as Compared with Other Types of Meningitis in Admissions to the Cook County Hospital from Jan. 1, 1937, to Feb. 1, 1940*

Types	Cases
Tuberculous meningitis	158
Meningococcic meningitis	105
Pneumococcic meningitis	71
Streptococcus haemolyticus meningitis	36
Influenzal meningitis	29
Lymphocytic meningitis	18
Streptococcus viridans meningitis	6
Staphylococcic meningitis	3
Unclassified meningitis	33

TABLE 2.—*Distribution of Types in the Forty-Two Cases of Pneumococcic Meningitis That Were Typed*

Type	Recoveries	Deaths
I	1	1
II	..	2
III	..	4
IV	1	0
V	..	2
VI	1	4
VII	..	1
VIII	..	2
IX	..	1
X	1	1
XII	..	1
XIV	..	1
XVII	1	0
XVIII	1	6
XXII	..	1
XXIII	1	3
XXV	..	1
XXXI	1	0

PROTOCOLS OF CASES IN WHICH RECOVERY OCCURRED

CASE 1.—A Negro youth aged 15 had the usual signs of meningeal irritation when admitted on the eighth day of his illness but he was still conscious. There was slight injection of the right ear drum and he had a moderately inflamed throat. Type I pneumococci were found in cultures of the blood and spinal fluid but not in direct smears—a favorable prognostic sign. Recovery occurred after vigorous dosage with sulfanilamide and specific antiserum.

CASE 2.—A Negro girl aged 15 years was admitted on the third day after the onset of headache and pain in the left ear. The drum was incised at once and green pus escaped. Because of a delay in typing the organism only sulfanilamide in large doses subcutaneously was given the first two days. After type XVII pneumococci were identified in the spinal fluid and blood, 80,000 units of specific rabbit serum was injected intravenously. Sulfanilamide was continued by mouth. Additional serum was given until a total of 340,000 units had been administered. This case illustrates the necessity of establishing drainage in all purulent lesions due to pneumococci, in addition to chemotherapy and serum therapy.

CASE 3.—A white girl aged 8 years was admitted because of stiff neck, fever and frequent convulsions of one day's duration. Examination revealed nothing noteworthy beyond the usual signs of meningeal irritation. In the spinal fluid the cell count was 7,900. No organisms were seen on direct smear, but the next day a growth of type VI pneumococci was obtained. Small doses of sulfanilamide were given on the second and fourth hospital days, but it was not given in consecutive doses each day until the sixth day of hospitalization. Type specific serum was started on the second hospital day and continued at frequent intervals through the eighteenth day. After fourteen days the temperature became normal and remained so until the twenty-eighth day, at which time there was some evidence of fluid in the right side of the chest. X-ray examination revealed only a thickened pleura. A diagnostic thoracentesis was not done. The temperature returned to normal in four days.

TABLE 3.—*Data on All Cases of Pneumococcic Meningitis from Jan. 1, 1937, to Feb. 1, 1940*

Distribution by Ages									
Under 1 Year	1-5 Years	5-10 Years	10-20 Years	20-30 Years	30-40 Years	40-50 Years	50-60 Years	Over 60 Years	Total
8	5	9	8	7	5	15	9	5	71

Other Pathologic Changes Encountered in Forty-Nine Cases of Pneumococcic Meningitis *

	Times		Times
Otitis media	24	Old healed skull fracture	4
Pneumonia (lobar or bronchial)	27	Recent skull fracture	3
Vegetative endocarditis	5	Suppurative ethmoiditis	1
Fibrinous pleuritis	2	Diabetes	1
Fibrous pleuritis	1	Lymphogranulomatosis	1
Thrombosis, right leg	1	Meningitis with no other important pathologic changes	6
Pneumococcic peritonitis	1		

Patients who came to autopsy	29
Patients well enough studied that conclusions as to accompanying pathologic changes could be drawn	20
Cases not included because the clinical data is inadequate	22

* The twenty-two cases treated by the authors and described elsewhere in detail are included.

In this case, as in others, the absence of large numbers of pneumococci in direct smears, together with a relatively high spinal fluid cell count, proved a favorable prognostic sign. The presence of an associated lesion in the chest, plus the inadequate dosage of sulfanilamide at the start of treatment, probably accounts for the large total dose of specific serum required for recovery in this case.

CASE 4.—A white man aged 76 was admitted in a semicoma with signs of meningeal irritation. No associated pathologic changes were found in the lungs, ears and sinuses. In the spinal fluid, containing 1,500 cells per cubic millimeter, no organisms were seen, but cultures yielded large numbers of type XXXI pneumococci. Sulfanilamide 6.4 Gm. daily was given subcutaneously the first three days, after which time the patient was able to take it by mouth until three weeks after he became afebrile. Serum was continued to the sixth day. A blood transfusion was performed on the fourth day because of the patient's weakened condition.

This case shows that aged subjects may recover from pneumococcic meningitis if promptly and vigorously treated. The absence of associated focal pneumococcic lesions was, no doubt, important in recovery.

CASE 5.—Juanita W., aged 12 years, a Negress, was admitted to another hospital two days before admission to the Cook County Contagious Hospital because of generalized convulsions.

She was thought to have jacksonian epilepsy because of a known skull fracture in 1934, followed two years later by several convulsive seizures. Pneumococcic lesions beyond the meningitis were not found. Blood culture was negative. Sulfapyridine was started the day of admission and continued beyond her febrile period. Specific antipneumococcus serum (type

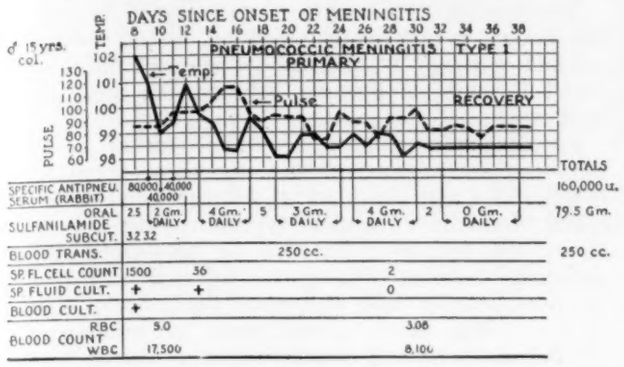

Chart 1.—Course in case 1.

XXIII) was started the third day of illness. The anemia, which necessitated blood transfusions, was thought to be due to sulfapyridine. The low level of sulfapyridine in the spinal fluid, as compared with that in the blood, is noteworthy.

Again, favorable prognosis in so-called primary meningitis as opposed to those complicated by other serious lesions is demonstrated.

CASE 6.—Marie F., aged 14 years, white, was admitted on the second day of a "primary" pneumococcic meningitis. Type XVIII organisms were identified directly in the spinal fluid and intensive therapy was begun at once. Sodium sulfapyridine was given the first two days to establish quickly an adequate blood level, after which oral doses of 2 Gm. every four hours were continued for four days to maintain it. When the dosage

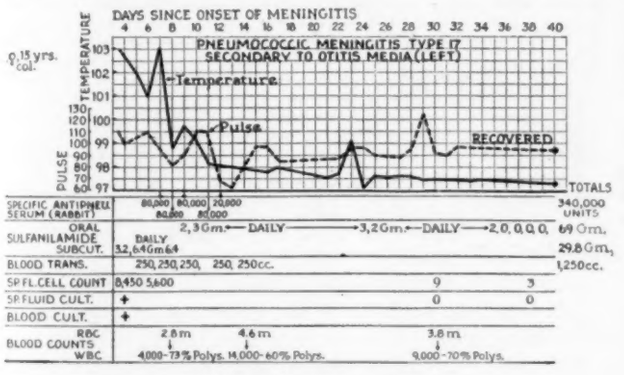

Chart 2.—Course in case 2.

was dropped to 1 Gm. every four hours there was a recrudescence of the disease with a sharp rise in temperature. When the dose of sulfapyridine was increased, the temperature dropped again.

The microscopic agglutination test with type XVIII pneumococci was strongly positive on the eighteenth day of illness. The single spinal fluid level of sulfapyridine that was determined was found to be much lower than the blood level.

CASE 7.—Antonia R., a Mexican woman aged 42, was admitted on the seventh day of meningitis due to type X pneumococci. No associated pneumococcic lesions were present. Again the plan of intensive serum therapy at the start, combined with sodium sulfapyridine administered intravenously to attain a high blood level, quickly proved effective.

COMMENT

Only those who have observed cases of pneumococcic meningitis at first hand can appreciate how desperately ill these patients are before treatment is begun. Bacteremia is practically always present. In most cases there are also advanced pathologic changes (table 3) in other parts of the body. When vegetative endocarditis was present (table 4) we had no recoveries and found none in the reports of other workers. Extensive unresolved pneumonia of many days' duration was also an accompanying factor which presaged an unfavorable outcome. When the spinal fluid cell count was relatively low and the number of pneumococci in the centrifuged sediment quite high, the outlook was usually rather hopeless. On the other hand, a relatively high leukocyte count with few or no pneumococci

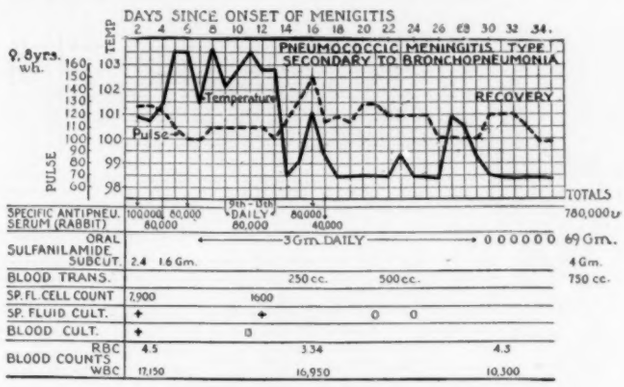

Chart 3.—Course in case 3.

on direct smear usually indicated a more favorable outcome. The best prognosis appears to be in those cases in which the disease is primary, i. e. unaccompanied by demonstrable pathologic changes elsewhere. Those cases secondary to otitis media, without pulmonary or cardiac involvement, have a reasonably good chance of recovery if drainage of the suppurative lesion is instituted quickly.

In reviewing our fatalities it was felt that only patient 1 (table 4) might have been saved by more prompt and vigorous treatment. Patient 14 became rational and afebrile after four days of treatment with sulfapyridine. The drug was continued, however. On the sixteenth day of illness the temperature again rose and focal signs pointing toward a lesion of the

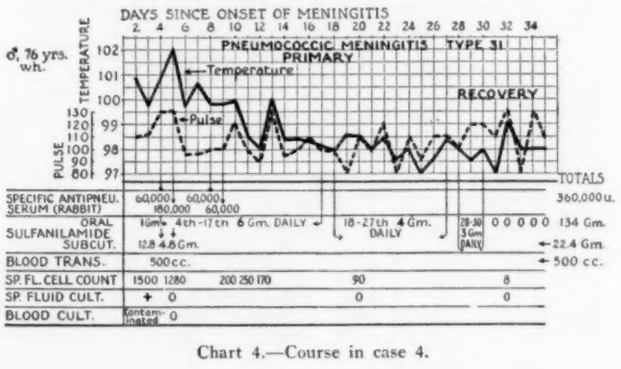

Chart 4.—Course in case 4.

right hemisphere appeared. The patient died suddenly. At autopsy an abscess of the right frontal lobe with extensive purulent meningitis was found.

PRESENT PLAN OF TREATMENT

Since we are convinced that specific antibody should be given in cases of meningitis along with chemotherapy, our first concern after making the diagnosis of suppurative meningitis is to discover the etiologic agent. Gram stains of the spinal fluid are made at once and if organisms having the structure of pneumococci (or

meningococci, Bacillus influenzae, Friedländer's bacillus) are discovered, sulfapyridine is begun at once while pneumococcus typing by the Neufeld method is carried out.

In adults, unless there is some contraindication, such as known sensitivity to sulfapyridine, severe leukopenia or jaundice, the sodium salt of sulfapyridine in doses of from 4 to 6 Gm. in 5 per cent solution is given intravenously. This is repeated every twelve hours until a blood level preferably of from 10 to 20 mg. per hundred cubic centimeters is attained. Usually large doses up to 2 Gm. every four hours, day and night, by mouth are required to keep the level at this figure for the first few days. Later, slightly smaller doses of from 1 to 1.5 Gm. every four hours may suffice.

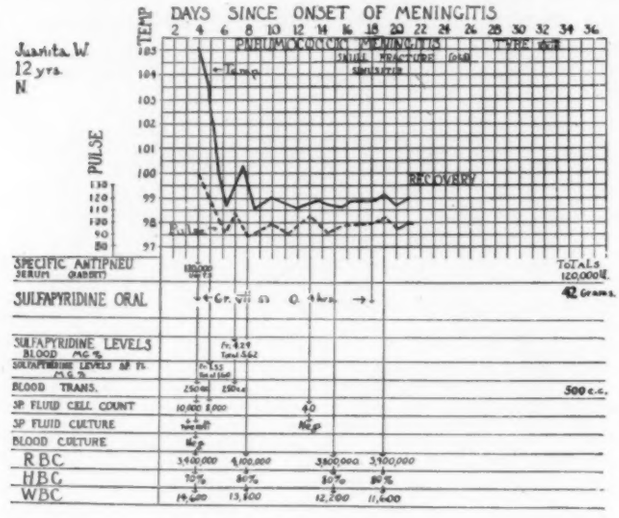

Chart 5.—Course in case 5.

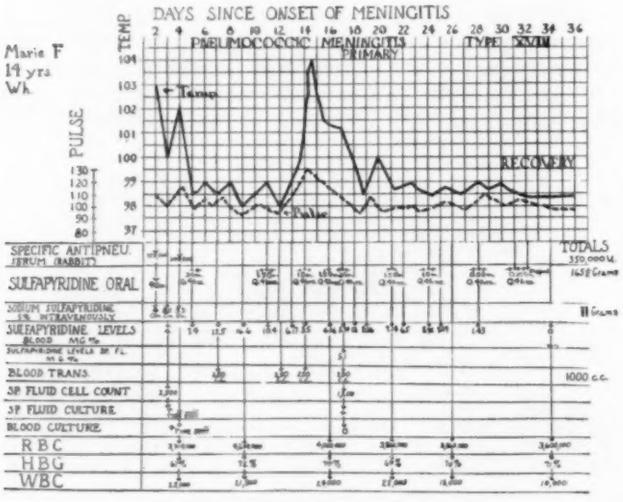

Chart 6.—Course in case 6.

For children the dosage is calculated on the basis of from 1 to 1½ grains per pound (0.065 to 0.1 Gm. to 450 Gm.) of body weight for each twenty-four hours, the dose being divided equally into six parts and administered every four hours, after an initial dose equaling one half the calculated day's dosage. That is, a child weighing 60 pounds (27 Kg.) would receive from 10 to 15 grains (0.65 to 1 Gm.) every four hours.

Usually the sodium salt needs to be administered for only two or three days. Sulfapyridine is continued until the temperature has been normal for several days and until the spinal fluid and blood cultures are sterile. If possible, microscopic agglutination tests are done at intervals of from two to three days. Sulfapyridine should not be stopped before a four plus reaction has been obtained.[6]

When sulfapyridine cannot be swallowed by a comatose patient it may be administered, mixed with water or milk, through a small caliber stomach tube, introduced through an opening between the teeth forced by a wedge.

Specific antipneumococcic rabbit serum is given intravenously as soon as the organism is typed. If pneumococci are not present in large numbers in the spinal fluid, direct Neufeld typing may be impossible. If so, the test may have to be performed on the peritoneal exudate of a mouse, injected from four to six hours earlier with the spinal fluid, or on cultures of the spinal fluid. Large doses of serum—up to 600,000 units in one day in one case in our series—are given intravenously in the usual way after the usual precautions against serum reactions have been

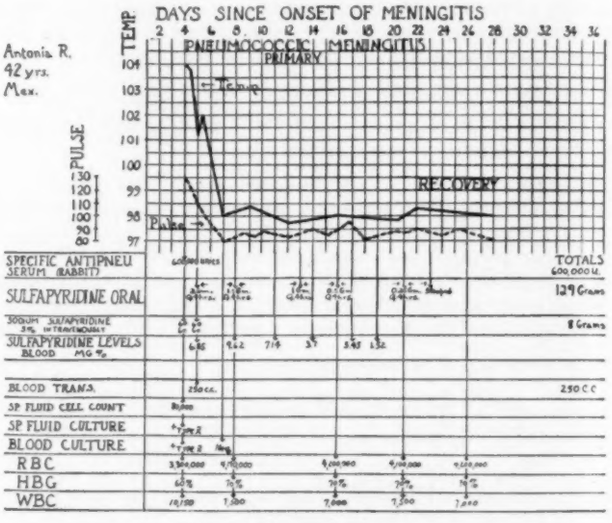

Chart 7.—Course in case 7.

taken. In adults the first day's dose is seldom less than 200,000 units.

Secondary anemia and occasionally leukopenia may result from the severity of the infection or from the use of sulfapyridine—more often the latter. When this occurs, our plan is to combat the anemia by frequently repeated transfusions of from 250 to 500 cc. of blood rather than by withdrawal of the drug, unless there are other important reasons why sulfapyridine should be stopped.

Surgical removal or drainage of any infected foci, particularly the sinuses and ears, is extremely important. The fluid intake and output should be carefully recorded, and if the output is adequate fluids up to 3,000 cc. daily are administered intravenously or by hypodermoclysis. In cyanotic patients, particularly those with associated pneumonia, oxygen is administered if possible.

SUMMARY AND CONCLUSIONS

1. In a series of twenty-two consecutive cases of pneumococcic meningitis treated by us with the combined use of sulfanilamide or sulfapyridine (and its

6. Gross, Paul; Cooper, F. B., and Lewis, Marion: Therapeusis of Experimental Type I Pneumococcic Meningitis in Rats, Am. J. M. Sc. **198**: 66 (July) 1939.

TABLE 4.—*Summary of the Fifteen Fatal Cases Treated by the Authors*

Case	Date of Admission	Age; Sex; Color	History	Admission Diagnosis	Days in Hospital	Condition on Admission	Initial Lumbar Puncture	Pneumococcus Type	Spinal Fluid Culture	Blood Culture	Blood Transfusion	Sulfanilamide	Sulfapyridine	Specific Rabbit Serum	Autopsy
1	5/21/38	15 ♂ White	Headache, fever 3 days, following a head injury; known skull fracture 3 years before	Suspect meningitis; otitis media	14	Temperature 106 F., comatose	25,250 W. B. C., many pneumococci	XXV	+	+	1,000 cc.	19 Gm.	0	240,000 units	No autopsy; in light of later experience we think earlier and larger doses of sulfanilamide and serum might have saved this patient
2	7/27/38	21 ♂ White	Headache following automobile accident; temperature 103.6 F. 4 days later	Suspect meningitis; skull fracture	1	Semicoma; pupils unequal	8,000 W. B. C., many pneumococci	VIII	+	+	0	8 Gm.	0	240,000 units	Extensive purulent leptomeningitis; basal skull fracture
3	8/10/38	34 ♀ White	Vomiting 2 days; headache, stiff neck 1 day; known diabetes	Suspect meningitis	1½	Alert; acutely ill	1,500 W. B. C., few pneumococci	VI	+	+	0	5.2 Gm.	0	100,000 units	No autopsy; urine had diacetic acid 4+ in spite of large doses of insulin
4	9/20/38	49 ♂ White	Headache and stiff neck 2 days	Suspect meningitis; catarrhal otitis	3	Alert; acutely ill	1,950 W. B. C., many pneumococci	XXVIII	+	+	250 cc.	15.1 Gm.	0	240,000 units	Acute purulent leptomeningitis; purulent cellulitis of right ear; lobular pneumonia
5	8/23/38	6 ♂ White	Fever, convulsions, headache, vomiting for 36 hours	Suspect meningitis; lobar pneumonia	8 hours	Comatose; temperature 106.8 F.	400 W. B. C., many pneumococci	XVIII	+	0	0	1.6 Gm.	0	74,000 units	Purulent leptomeningitis; confluent lobular pneumonia of right upper lobe; recent pleuritis, left side; vegetative endocarditis
6	10/23/38	51 ♂ White	Earaches 3 months; irrational, maniacal 2 days	Suspect meningitis; otitis media right	3	Comatose; temperature 102 F.; cyanotic	5,500 W. B. C., many pneumococci	III	+	0	250 cc.	37.6 Gm.	0	320,000 units	No autopsy; spinal fluid practically free of organisms at the time of death
7	11/ 1/38	12 ♀ White	Headache 4 days; stiff neck, deafness, fever 1 day	Suspect meningitis	17	Alert; acutely ill	900 W. B. C., very few pneumococci	XIV	+	Contaminated	1,500 cc.	68 Gm.	24 Gm.	515,000 units	No autopsy: had showers of petechiae; all clinical signs of vegetative endocarditis
8	11/12/38	4 ♂ White	Draining left ear 4 months; acute otitis media 4 days; vomiting, fever 2 days	Suspect meningitis; bilateral otitis	6	Comatose; moribund	Purulent; 300 W. B. C., pneumococci 4 plus	XVIII	+	+	700 cc.	0	17 Gm.	682,000 units	Extensive purulent leptomeningitis; confluent lobular pneumonia involving all lobes; bilateral otitis media
9	12/26/38	50 ♂ White	Headache, vomiting, irrational 1 day; skull fracture 1 year ago	Suspect meningitis	3	Comatose	14,500 W. B. C., few pneumococci	XXII	+	+	0	0	20 Gm.	400,000 units	No autopsy
10	12/14/38	33 ♂ White	Lobar pneumonia 10 days; stiff neck 1 day	Lobar pneumonia; suspect meningitis	8	Practically moribund	1,500 W. B. C., few pneumococci	XXIII	+	+	250 cc.	18.5 Gm.	90 Gm.	0	Extensive purulent leptomeningitis, vegetative endocarditis; pneumonia involving all lobes
11	2/ 8/39	50 ♂ White	Admitted in coma; no history	Suspect meningitis	2	Coma	Purulent; 25,000 W. B. C., intra-extra-cellular diplococci	IX	+	Negative	0	0	15 Gm.	248,000 units	No autopsy
12	2/16/39	59 ♂ White	Onset 4 days ago of chill, fever, cough headache and stiff neck	Suspect meningitis	2	Coma	Purulent; 47,000 W. B. C.	Not typed	Not done	Not done	0	4 Gm. intravenously	0	0	Suppurative basilar pneumococcic meningitis; focal bronchopneumonia of both lower lobes; case was mistaken for epidemic meningitis; received 100,000 units of meningococcus antitoxin intravenously
13	3/13/39	16 mo. ♂ White	Pertussis past 6 weeks; irritable 3 days; fever and convulsions	Suspect meningitis	8	Coma; temperature 106 F.	3,800 W. B. C., intra-extra-cellular diplococci	X	+	0	250 cc. daily	0	24 Gm.	0	Diffuse suppurative leptomeningitis; confluent bronchopneumonia; bilateral otitis; thrombosis of left middle cerebral vessels
14	4/ 1/39	32 ♂ Negro	Head injury 3 months ago; headache 4 weeks; dizziness and stiff neck 3 days; history of syphilis; 4/3/39 spinal Wassermann negative	Suspect meningitis	18	Alert	6,000 W. B. C., many pneumococci	XXIII	+	0	700 cc.	...	87 Gm.	Not available	Abscess right frontal lobe with extension to meninges; localized meningitis: infectious hyperplasia of spleen, cloudy swelling of liver and kidney; fatty changes in liver
15	10/ 6/39	44 ♂ White	Transfer from another hospital with diagnosis: epidemic meningitis; received there 150 cc. antimeningococcus serum intravenously, same amount intraspinally	Epidemic meningitis	1	Terminal	Purulent; many gram-positive intra- and extracellular diplococci	XVIII	+	+	0	8 Gm. intravenously	0	0	No autopsy; this case of pneumococcic meningitis was mistakenly treated as epidemic meningitis

sodium salt) and specific antipneumococcus rabbit serum there were seven recoveries.

2. In the period covering these cases, more patients were admitted to the Cook County Hospital with pneumococcic meningitis than with meningococcic meningitis. The old teaching that purulent meningitis should be treated as meningococcic meningitis until proved otherwise is entirely outmoded. A vigorous search for the etiologic agent must be started at once and pursued until the organism is determined. Pending that time, sulfapyridine by mouth or its sodium salt intravenously should be given in large doses, unless hemolytic streptococci are strongly suspected, in which case sulfanilamide may be the better chemotherapeutic agent.

3. The best prognosis in cases of meningococcic meningitis is in so-called primary cases, i. e. those unassociated with other demonstrable pneumococcic lesions. The worst prognosis is in those cases associated with pneumococcic endocarditis and/or extensive pneumonia.

4. In addition to vigorous chemotherapy and serum therapy, surgical drainage of focal lesions, care to maintain an adequate fluid and caloric intake and occasionally blood transfusions are of the utmost importance.

Clinical Notes, Suggestions and New Instruments

MORGAN'S BACILLUS SEPTICEMIA

REPORT OF A CASE AND REVIEW OF EXTENT OF PATHOGENICITY OF THE ORGANISM

E. J. PULASKI, M.D., AND G. W. DEITZ, M.D., PHILADELPHIA

In 1906 Morgan isolated, from the stools of infants with "summer diarrhea," a previously undescribed gram-negative bacterium, Morgan's bacillus No. 1, which he considered of possible etiologic significance. Numerous papers have appeared since, denoting the pathogenicity of this organism not only in gastrointestinal disturbances but in other conditions as well.

The purpose of this paper is to present a fatal case of Morgan's bacillus septicemia, to record the failure of sulfanilamide and sulfapyridine therapy and to review some of the literature on Morgan's bacillus infections.

Septicemias due to Bacterium morgani are rare. Morgan grew the organisms from the heart blood taken after death from three children with summer diarrhea. Kendall, Day and Bagg cultured Bacterium morgani, also the Shiga bacillus, Bacillus alkaligenes and streptococci from the blood two days before death in a case of infantile diarrhea (antemortem invasion?). Probably the first recorded case of sepsis is that of Magath and Jackson, who obtained positive blood and feces cultures of Bacterium morgani in a fatal case of ulcerative colitis. The blood serum agglutinated the organisms in a 1:40 dilution. Thjotta obtained positive blood cultures and agglutination reactions in a fatal septicemia consequent upon Bacterium morgani empyema of the gallbladder. King isolated the organisms from the blood and lateral sinus in a case of mastoiditis with sinus thrombosis. Havens and his co-workers recorded six positive blood cultures in a series of forty-nine cases of a paratyphoid-life fever and listed two deaths. Specific antibodies could be demonstrated in the blood in most cases. D'Aunoy and Gittins and Hawksley also reported one case each of a typhoid-like fever with Bacterium morgani bacteremia.

Morgani's bacillus has been considered of etiologic relationship to infant diarrhea and dysentery. On the other hand the organism has been found in samples of soil and water and in the feces of healthy persons, and it has been recovered from many species of animals. However, it can be pathogenic in man and has been identified in cholecystitis (Thjotta) colitis (Thjotta, Magath and Jackson), mastoiditis (Dick, Dick and Williams, King, Sutton), meningitis (Gittins and Hawksley, Mitchell, Bier and Lange), peritonitis (Neter and Goodale), pyelitis (Jervell, Waaler, D'Aunoy, Riding), chronic discharging wounds (Whittingham, Fasting). It has been demonstrated in conjunction with mental disease (Stewart).

REPORT OF CASE

F. W., a white man aged 25, admitted to the hospital Sept. 12, 1939, was working over an acetylene torch August 21 when a hot spark flew into the left ear. He was seen almost immediately in the dispensary of this hospital, and inflammation of the external auditory canal (attendant on burn) was noted. Butesin picrate ointment was applied. Four days later he was still complaining of pain, although the inflammation had receded considerably. He was not seen again until seventeen days later (September 11), when he returned complaining of increasingly severe pain over the entire left side of the head and neck but especially in the left ear, which, he stated, discharged watery material from time to time. He also complained of weakness, occasional dizziness, a feeling of heaviness over the eyes and poor appetite. The temperature was 102.2 F. An extensive inflammatory process of the entire left external auditory canal was observed. Continuous hot wet compresses were advised, but since there was no appreciable improvement in twenty-four hours the patient was admitted to the hospital.

The past history revealed no previous disease of the ears. Because of the pain in the ear he had the left upper second and third molars extracted at another hospital the week before admission.

On examination the patient was toxic and apathetic, complaining of pain in the left ear and of a heavy aching over the eyes. The temperature was 103.2 F. There were a slight unproductive cough and profuse sweating. The left upper alveolar process showed evidence of recent extractions of teeth. The pharynx was slightly injected, and the tongue was coated. There was an extensive cellulitis of the entire left external auditory canal, with a small amount of thin watery foul-smelling discharge.

Tenderness was present over the ear anteriorly but not over the mastoid. The tympanic membrane could not be visualized. There was no regional lymphadenopathy. Examination of the heart, lungs, abdomen and extremities was negative. Ophthalmoscopic examination revealed blurring of both disk margins. Neurologic examination was entirely negative. The clinical impression was otitis externa with possible mastoid or intracranial involvement.

The leukocyte count was 8,200, with 92 per cent neutrophils. The erythrocyte count was 4,000,000 and the hemoglobin level 80 per cent. The urine was normal. Throat culture yielded hemolytic and nonhemolytic streptococci and Staphylococcus albus. Examination of the spinal fluid was negative. The dynamic factors were normal. Culture of the fluid remained sterile. The blood Wassermann reaction was negative. Culture of the material discharging from the left ear yielded a gram-negative motile bacillus that did not ferment lactose. Culture of blood taken a week after admission gave an abundant growth of a gram-negative motile rod, identical with that obtained from the ear. Bacillus typhosus antiserum did not agglutinate this organism.

Agglutination tests of the patient's blood with Bacillus typhosus, Bacillus paratyphosus A and B, Bacillus proteus X 19 and the Brucella antigens were negative on four occasions.

Roentgen examination of the mastoids showed diffuse clouding suggestive of chronic mastoiditis on the left side. X-ray examination of the paranasal sinuses and chest was negative. Examination of the teeth showed rarefaction around the root of the first upper left premolar.

Compresses and irrigations of the ear were begun, and the patient was given sulfanilamide. The pain in the head and

The authors were assisted in this case by Drs. W. L. C. Spaeth and S. Sugarman.

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ear was so severe that continued administration of opiates was necessary for relief. The day following admission (September 13) he had a chill lasting ten minutes with an abrupt rise of temperature. The cough became more annoying, and signs of bronchitis were present. Anorexia and vomiting were pronounced. The temperature varied from 99 to 103 F., but the pulse rate consistently remained below 90 per minute. Physical and mental exhaustion progressed.

As the cellulitis of the ear gradually subsided, the discharge became more copious and fetid. When it became possible to visualize the tympanic membrane, a pinpoint perforation of the superior posterior quadrant was seen. However, there was no bulging, and the discharge appeared to originate entirely from the canal wall. At this time the anterior cervical nodes became palpable and tender. The patient's serum agglutinated Morgan's bacilli in a 1 : 160 dilution.

September 17 he had another severe chill and began complaining of soreness of the left side of the mouth. A localizing inflammation around the first upper left premolar was found. September 20 he had a chill about fifteen minutes in duration. The eyegrounds revealed the same blurring of the nerve heads found previously, with a hemorrhagic area above the disk on the right side. Spinal fluid examination was again entirely negative.

The patient became increasingly stuporous. The skin and scleras were jaundiced. He complained of generalized aching with severe sweats.

The cough increased. September 24, twelve days after admission, he complained of severe pain in the right side of the chest. Physical examination revealed diminished breath sounds in the right lower lobe. That evening he had a shaking chill and the temperature rose to 105.3 F. The cough became more constant, and productive. Sputum examination on three occasions revealed the presence of many pus cells, staphylococci, streptococci, pneumococci (nontypable) and gram-negative bacilli. Blood culture gave an abundant growth of Morgan's bacilli. The blood serum agglutinated Bacterium morgani antigen to a titer of 1 : 320. Roentgen examination of the chest revealed pneumonia of the right lower lobe. The leukocytes numbered 28,000 and the erythrocytes 3,200,000. An indirect blood transfusion (500 cc.) was given. The next few days he had several shaking chills. Sulfapyridine was given, without apparent benefit. The jaundice deepened. The sweating was more profuse and the mental confusion was worse.

September 30, eighteen days after admission, pain developed in the left side of the chest, and physical signs indicative of pneumonia in the left lower lobe were found. The left ear began to discharge the same foul material. The patient became more toxic and irrational. The blood serum agglutination with Bacterium morgani was only 1 : 40 on October 1. October 2 he complained of pain in the neck along the anterior border of the sternocleidomastoid muscle, which was tender to palpation. A swelling appeared, and four days later 6 ounces of thin grayish foul-smelling pus was removed from the abscess. This material yielded a pure culture of Bacterium morgani. At the same time, a small abscess around the upper left first molar was opened. Only Staphylococcus aureus was obtained on culture of the pus. The neck continued to drain freely. Expectoration of foul-smelling sputum was constant. He became progressively worse and died October 23. Bacterium morgani was never isolated from any of the samples of stools or urine examined.

On postmortem examination, the changes of interest were chiefly in the head and chest. The brain was edematous and congested, but no evidence of an inflammatory process was found in the meninges. The lateral sinuses were explored from the torcular Herophili to the jugular bulb, and there was no evidence of thrombi nor of thrombophlebitis. Cultures remained sterile. The left mastoid cells, when opened, contained some exudate which when cultured showed the presence of an anaerobic nonhemolytic streptococcus but no Morgan's bacilli. On opening the chest, both pleural cavities contained large quantities of foul-smelling mucopus. Both lungs were riddled with abscesses of various sizes both on the exterior and on the interior of the lungs. One large abscess had ruptured into the left pleural cavity. Both lungs showed dense adhesions to the chest wall. The pus yielded a pure culture of Bacterium morgani. The heart was soft and flabby. Culture from the heart blood also yielded Morgan's bacilli. The intestine showed no inflammation, and the peritoneal cavity was grossly normal. The kidneys were swollen, flabby and edematous and suggested toxic nephrosis.

BACTERIOLOGY

The organism is a gram-negative aerobic nonsporing rod from 1 to 3 microns long, motile when freshly isolated. On frequent subculture at 37 C. motility is greatly diminished, but the organisms remain actively motile if grown at 20 C. They are easily cultivated on ordinary laboratory mediums. When freshly isolated, colonies show a tendency to swarm and in this respect resemble Bacillus proteus. There is a characteristic strong fecal odor, which is lost after subculture. Later generations form colonies not unlike Bacillus coli. Dextrose, fructose and galactose were fermented with the production of acid and gas as was trehalose. There was no action after thirty days on arabinose, rhamnose and xylose, lactose, sucrose and maltose, mannitol, sorbitol, dulcitol, inositol and salicin. Indole and hydrogen sulfide were formed abundantly. Nitrates were not reduced. Litmus milk was turned slightly alkaline. Gelatin was not liquefied. The organism acts on sheep red cells with the production of methemoglobin.

These observations are essentially the same as reported by Jordan, Crawford and McBroom in a study of many strains of Bacterium morgani.

SUMMARY

1. A fatal case of sepsis was apparently due to Morgan's bacillus, with the external auditory canal as the probable port of entry. Specific agglutinins were demonstrated in the blood stream. Morgan's bacillus was isolated post mortem from the heart blood and the abscesses in the lungs.

2. Sulfanilamide and sulfapyridine therapy were of no benefit.

3. A review of the literature denotes the extent of the infectiousness of the organism.

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MENINGITIS EPIDEMIC AMONG NAVAJO INDIANS

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Although many [1] claim that meningococcic meningitis usually strikes only one member of a family, this did not hold true during a recent epidemic on the Navajo Reservation. Of twenty-eight patients seen at the Chin Lee General Hospital, in twenty-four instances there was a close family relationship to another patient or patients while in only four instances were the patients the only members of the family to contract meningococcic meningitis.

Since we saw multiple cases in the family early in the epidemic, whenever a Navajo contracted meningitis we urged that the younger members of the family be brought to the hospital for fourteen days' observation and prophylactic treatment; nineteen persons from families in which meningococcic meningitis had recently occurred were admitted to the Chin Lee General Hospital and 174 to the Northern Navajo Hospital, Shiprock, N. M., for this reason. Two thirds of these persons were under 10 years of age. At the Chin Lee Hospital, those weighing less than 80 pounds (36 Kg.) received a daily total dosage of sulfanilamide of one-half grain per pound (0.032 Gm. per 450 Gm.) body weight. Those weighing more than 80 pounds received a daily total dosage of 40 grains (2.6 Gm.). At the Shiprock hospital, Dr. R. K. Setzler (who gave permission to report those cases) and Dr. Jacob Seigel gave all their patients a daily total dosage of one-half grain per pound of body weight. At both hospitals this drug was continued for fourteen days. Fourteen days was chosen because most observ-

From the U. S. Indian Service.

1. Griffith, J. P. C., and Mitchell, A. G.: Diseases of Infants and Children, Philadelphia, W. B. Saunders Company, 1937, p. 319. Schamberg, J. F., and Kolmer, J. A.: Acute Infectious Diseases, Philadelphia, Lea & Febiger, 1928, p. 830.

ers agree that the incubation period of meningococcic meningitis is less than fourteen days.

None of the 193 persons who received sulfanilamide as a prophylactic developed meningococcic meningitis while taking the drug. Two of the 193 developed meningococcic meningitis approximately one month after discontinuing the drug. The remaining 191 did not develop the disease.

We can only estimate the rate of incidence in this epidemic because we know that not all cases that occurred were brought to our attention. The most accurate count that has been made for the areas concerned in the epidemic showed a population of 11,000. The physicians in the area know of ninety-two cases. This gives an approximate incidence of one case to 120 of population. This is a very high rate of incidence, since one case to 800 population is considered epidemic.[2]

One of the patients who received prophylactic treatment was a nursling aged 1½ months whose mother had meningococcic meningitis. The infant suckled at her mother's breast up to the second day of illness and thereafter was in intimate contact with her mother and in less intimate contact with other patients with the disease. That the infant did not become ill may have been because (*a*) the child was actively immune, (*b*) the child was passively immune, (*c*) the child escaped contagion, or (*d*) sulfanilamide protected the child.

At 1½ months of age it is possible, but unlikely, that the child had developed an active immunity. It seems unlikely too that the child was passively immune, because it is generally agreed that the passive immunity displayed by infants is derived from the mother[3] and in this instance the mother demonstrated her lack of immunity by contracting the disease. However, instances of mothers who were susceptible to diphtheria or scarlet fever while the nursling was immune have been reported.[4] As to the child escaping contact with meningococci, any one observing the intimate contact between mother and child before and after the diagnosis was made would dismiss that possibility. If one reasons by exclusion, the possibility of sulfanilamide having protected the child grows more likely as the other possibilities seem less likely, and especially so since it has been demonstrated that sulfanilamide has curative value in cases of meningococcic meningitis.[5]

It is possible that in a group of 193 persons selected at random none of them might contract meningitis in any epidemic during a fourteen day period, although I feel strongly that this particular group of persons had far more possibility of contracting the disease than is usual because of their concentrated exposure and the higher rate of susceptibility in the residents of the Navajo Reservation at this time. This would seem especially true since the epidemic showed a strong tendency to affect successive members of the same family in a short period of time.

SUMMARY

In an outbreak of meningococcic meningitis on the Navajo Reservation the disease tended to affect several members of the same family.

This was a very severe epidemic.

Nothing in this study would indicate that sulfanilamide in moderate doses is valueless as a prophylactic for meningococcic meningitis during the time it is being administered.

2. Schamberg and Kolmer: Acute Infectious Diseases, p. 829. Griffith and Mitchell.[1]
3. McKhann, C. F., and Kapnick, Israel: J. Pediat. **13**: 907 (Dec.) 1938.
4. Wadsworth, Augustus, and Hoppe, Ella N.: J. Exper. Med. **53**: 821 (June) 1931.
5. Schwentker, F. F.: J. Pediat. **11**: 874 (Dec.) 1937.

Qualifications Necessary for a Flight Surgeon.—The qualifications necessary for a properly trained and successful flight surgeon are many and exacting. As in any other specialty, aviation medicine should be built on a solid foundation of general medical knowledge. An intense interest in any one specialty of general medicine is not desirable, owing to the narrow outlook which usually accompanies such an interest. A well rounded, many-sided man is much to be preferred.—Armstrong, Harry G.: Principles and Practice of Aviation Medicine, Baltimore, Williams & Wilkins Company, 1939.

Special Clinical Article

USE OF SULFANILAMIDE AND RELATED COMPOUNDS IN DISEASES OF INFANCY AND CHILDHOOD

CLINICAL LECTURE AT NEW YORK SESSION

BENJAMIN W. CAREY, M.D.
DETROIT

The advent of the sulfonamide compounds has probably had a more favorable effect on the course of many infectious diseases in pediatrics than in any other field of medicine. This paper will present as briefly as possible the indications for the use of the various drugs, the results of treatment, dosage and methods of administration of the sulfonamide compounds, contraindications to chemotherapy, and toxic manifestations of the drugs in infants and children.

BETA HEMOLYTIC STREPTOCOCCUS INFECTIONS

Erysipelas.—Response to therapy has been dramatically favorable in this type of infection. A reduction in the mortality of patients under 2 years of age from approximately 35 per cent to 5 per cent has occurred in most hospitals in which erysipelas is treated. The majority of deaths has occurred in cases of overwhelming infection in less than twenty-four hours after admission to the hospital. More experience has been gained with sulfanilamide, but favorable results have been observed with sulfapyridine and sulfathiazole. Sulfanilamide is probably the drug of choice because of its rapid absorption and its ease of administration.

Respiratory Infections.—Response to chemotherapy in infections of the upper respiratory tract due to the beta hemolytic streptococcus such as rhinitis, pharyngitis, tonsillitis, sinusitis and otitis media has been unpredictable in many instances. However, if the infection is suspected or proved to be due to the beta hemolytic streptococcus, routine administration of sulfanilamide is desirable. Complications may be averted, especially mastoiditis, which may be prevented or aborted with prompt and effective administration of the drug. Present experience suggests that sulfapyridine or sulfathiazole is as effective as sulfanilamide in this group of infections.

Bronchitis, Pneumonia and Empyema.—Experience has been somewhat limited in this group of infections, but good results with chemotherapy have been observed. It is doubtful whether the incidence of surgical procedures has been materially reduced in cases of empyema by chemotherapy, but the course of the process may be shortened in certain instances and a spread of the pneumonia to the opposite lung may be prevented. Sulfathiazole is probably the drug of choice in this group because of the possibility of a mixed infection with the pneumococcus or the staphylococcus.

Septicemia.—Prompt sterilization of the blood stream and improvement in the lesion responsible for the septicemia has occurred in the majority of cases following chemotherapy. Other therapeutic measures such

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Read in the Symposium on Chemotherapy, General Scientific Meetings, at the Ninety-First Annual Session of the American Medical Association, New York, June 11, 1940.

The antipneumococcus rabbit serum used in cases of pneumococcic infection was furnished by the Lederle Laboratories, Inc., Pearl River, N. Y., and the sulfathiazole was supplied for clinical trial by the Squibb Institute for Medical Research, Dr. George A. Harrop, director, New Brunswick, N. J.

as blood transfusions and proper surgical intervention must not be overlooked or neglected. Sulfapyridine or sulfathiazole seems as effective as sulfanilamide.

Scarlet Fever.—Present experience indicates that chemotherapy combined with antitoxin or convalescent serum is the treatment of choice for most patients with scarlet fever. The drugs have no effect on the toxic manifestations of the disease but are responsible for the reduction in the number of complications due to invasion of the beta hemolytic streptococcus from the throat. Sulfanilamide seems to be the drug of choice, although favorable effects have been observed with sulfapyridine.

Meningitis.—Chemotherapy has been effective in bringing about a marked reduction in mortality due to beta hemolytic streptococcus meningitis. Prior to chemotherapy the mortality was nearly 100 per cent, and this has been reduced to approximately 15 per cent, according to a recent summary.[1] It is desirable to institute intensive treatment with oral, parenteral and intrathecal medication in this type of meningitis, and sulfanilamide is the drug of choice because of its greater diffusibility and the variety of methods for its administration. Sulfathiazole should not be used in meningeal infections, as its concentration in the spinal fluid reaches only from 10 to 30 per cent of that in the other body fluids (table 1).

Osteomyelitis.—In osteomyelitis due to the beta hemolytic streptococcus chemotherapy should always be instituted. The response to treatment may be unpredictable, but in acute cases of septicemia the infection may be more rapidly localized, the fever reduced and the blood sterilized. Occasionally the chronic form of the disease may be cured with chemotherapy.

Peritonitis.—Considerable disagreement exists as to the most effective plan of treatment of primary beta hemolytic streptococcus peritonitis. Early surgical drainage plus chemotherapy versus chemotherapy alone divides opinion among surgeons and pediatricians. Possibly no routine rule should be followed but each case should be individualized and effective measures adopted as the occasion demands. Undoubtedly chemotherapy has aided in lowering the fatality rate and complications in this form of infection. Too few cases have been treated to evaluate properly the effect of sulfapyridine or sulfathiazole or to compare these compounds with sulfanilamide.

STREPTOCOCCUS VIRIDANS INFECTIONS

Subacute Bacterial Endocarditis.—Although a few reports exist of patients with subacute bacterial endocarditis cured by chemotherapy, it is generally agreed that the most to be gained is a temporary improvement of the patient's condition and sterilization of the blood. Certainly no definite curative effect on the underlying pathologic condition has been demonstrated.

Septicemia.—Septicemia other than that accompanying endocarditis has responded favorably to chemotherapy. Sulfanilamide or sulfapyridine seems to be equally effective in bringing about a rapid sterilization of the blood.

Meningitis.—Cases of meningitis due to Streptococcus viridans are rare, but there are a few reports of favorable results with chemotherapy. I have observed three patients under 2 years of age with this type of meningitis who rapidly recovered following intensive treatment with sulfapyridine.

1. Kolmer, J. A.: Progress in Chemotherapy of Bacterial and Other Diseases, Arch. Int. Med. **65**: 671 (April) 1940.

PNEUMOCOCCIC INFECTIONS

Pneumonia.—Chemotherapy of pneumococcic pneumonia of infants and children has definite advantages over serum therapy: 1. Sputum typing of infants and children is difficult and more liable to error than of adult patients. 2. The finding of more than one type of pneumococcus in the sputum is not uncommon and is confusing if serum therapy is contemplated. 3. The administration of intravenous serum is a difficult procedure with infants and small children. In my experience pneumonia has been a relatively mild disease in the past two winters, which makes evaluation of specific therapy difficult. At the Children's Hospital of Michigan[2] it was found in the winter of 1938-1939 that the use of either sulfapyridine or specific antipneumococcus rabbit serum as compared with a series of untreated controls had the following effects: (1) reduction of the fatality rate, (2) reduction in the duration of the disease and subsequent period of hospitalization and (3) reduction in the incidence of complications such as meningitis, otitis media and mastoiditis, and empyema. During the past winter combined treatment with sulfapyridine or sulfathiazole and specific antipneumococcus rabbit serum has been compared with chemotherapy alone in the treatment of

TABLE 1.—*Sulfathiazole: Blood and Spinal Fluid Concentrations (Simultaneous Samples)*

Age	Date	Blood, Mg. per 100 Cc.	Spinal Fluid, Mg. per 100 Cc.
	Case 1		
6 mos.	April 23	6.4	2
	April 24	5.6	1.2
	April 26	4.5	0.8
	Case 2		
10 yrs.	May 9	3.4	0.8
	May 11	3.5	0.6
	May 14	5.6	0.4
	May 16	6.5	1.0

pneumococcic pneumonia. The fatality rate has been so low that no statistical differences could be found. However, in the cases in which serum combined with sulfapyridine or sulfathiazole was given it was observed that the temperature became normal about eighteen hours sooner after treatment was started than when the drugs alone were administered. In a group of cases therapy was also followed this year with the Francis test (type specific capsular carbohydrate substance) and it was observed that the cutaneous reaction after chemotherapy alone was quite irregular or remained negative even though a favorable response to the drug had occurred. This observation was correlated with the recurrence of the same type of pneumonia within two to three weeks in a group of six patients who were treated with sulfapyridine. In my experience sulfathiazole is as effective as sulfapyridine in cases of pneumococcic pneumonia. It is desirable to type all cases and to administer specific antipneumococcus rabbit serum to any patient with bacteremia, with involvement of large areas of lung or with extreme toxicity.

Empyema.—Chemotherapy has little effect on the course of pneumococcic empyema and the usual methods of surgical drainage need to be instituted. In the event that pneumonia is present in the opposite lung, or the patient is quite toxic with a high fever, administration of sulfapyridine or sulfathiazole may be desirable.

Otitis Media.—Chemotherapy with sulfapyridine or sulfathiazole should be instituted in the event that the pneumococcus is cultured from an infection in the

2. Carey, B. W., and Cooley, T. B.: J. Pediat. **15**: 613 (Nov.) 1939.

middle ear. This might be an argument for the administration of sulfapyridine or sulfathiazole rather than of sulfanilamide to all patients with otitis media.

Meningitis.—Reports may be found of cures of this type of meningitis with both sulfanilamide and sulfapyridine with and without the addition of specific serum. The desirable method of treatment is to administer adequate doses of sulfapyridine, intravenous antipneumococcus rabbit serum and intrathecal serum plus complement. However, good results will be obtained only in cases which are diagnosed and treated early.

Peritonitis.—In primary peritonitis due to the pneumococcus, chemotherapy has played an effective part. As with primary beta hemolytic streptococcus peritonitis it is advisable to individualize the case and not follow a routine rule about incision and drainage versus no surgery. Because of the greater effectiveness of sulfapyridine against the pneumococcus and action equal to sulfanilamide against the beta hemolytic streptococcus, it is advisable to administer sulfapyridine or sulfathiazole to a patient with primary peritonitis until such time as the exact bacterial diagnosis is made.

MENINGOCOCCIC INFECTIONS

Septicemia.—Excellent results have been reported with the use of sulfanilamide in sterilizing the blood in chronic meningococcemia. The results with sulfapyridine have been favorable but few cases have been reported.

Meningitis.—Many rapid cures have been reported following the use of sulfanilamide in meningococcic meningitis. In fact, results have been as good with the drug alone as with combined serum and sulfanilamide therapy. However, it is well known that certain strains of the meningococcus are resistant to sulfanilamide. While less experience has been obtained with sulfapyridine, reports in the literature and my experience lead me to believe that this drug is as effective as sulfanilamide. Sulfanilamide may be the drug of choice because of its greater diffusibility throughout the body and the ease and variety of methods of its administration. The failure of sulfathiazole to reach adequate concentrations in the spinal fluid should again be emphasized; this drug should not be administered for the treatment of meningitis. The question of antimeningococcus serum in addition to chemotherapy cannot be fully answered from my past experience. It has been my policy to reserve the use of intrathecal serum for patients who do not respond rapidly with sterilization of the spinal fluid and a reduction of the spinal fluid leukocyte count after from thirty-six to forty-eight hours of chemotherapy. In severe fulminating cases in which there is evidence of septicemia from the presence of multiple petechiae, it is advisable to initiate treatment with both intravenous meningococcus antiserum and parenteral sulfanilamide solution by hypodermoclysis or intravenously.

GONOCOCCIC INFECTIONS

Ophthalmia Neonatorum.—There is no doubt as to the efficacy of chemotherapy in reducing the complications and duration of the disease in this type of gonococcic infection. Michels [3] in 1938 showed in a series of fifteen patients treated at the Children's Hospital of Michigan that complications were reduced to zero and the average period of hospitalization was reduced from 28.5 days to 5.8 days. Since this report an equal number of patients has been treated with the same excellent result. Equally favorable results have been obtained with sulfapyridine.

Vulvovaginitis.—In general, the reports in the literature have shown similar results from chemotherapy in vulvovaginitis as in adult gonococcic infections. My experience has been limited to a small group of ten cases, in seven of which there was a rapid and permanent cure with sulfanilamide. The drug had little influence on the other three patients. From unpublished reports better results have been observed by combining endocrine therapy with sulfanilamide. Sulfapyridine has equally good effect and may even be superior to sulfanilamide, although few cases have been reported in which this compound was used.

STAPHYLOCOCCIC INFECTIONS

My experience with sulfanilamide and sulfapyridine in the common staphylococcic infections encountered in pediatrics, namely septicemia, osteomyelitis, pneumonia, furunculosis and other types of cutaneous infections, has convinced me that neither drug had much effect. With the advent of sulfathiazole new hope was raised for a form of chemotherapy with definite antistaphylococcus action.

Cutaneous Infections. — My experience with this group consists of two infants with infected eczema, two patients with furunculosis, one patient with impetigo and two patients with deep abscesses. In general the results were not dramatic but it was concluded that the drug probably had a definite effect in reducing the temperature and shortening the period prior to incision and drainage. According to the few reports in the literature at this time the experience of others has been similar.

Septicemia.—Six patients with staphylococcic septicemia were treated with sulfathiazole. Two of these were infants with acute ethmoiditis and septicemia, both of whom died within forty-eight hours of admission to the hospital. One patient with pneumonia and staphylococcic septicemia received only forty-eight hours of sulfathiazole therapy during seven days of hospitalization, an amount considered inadequate, and this patient died. Three patients had a staphylococcic septicemia accompanying acute osteomyelitis. The response to the drug was dramatic, with sterilization of the blood and reduction of the temperature to normal after twenty-four hours of chemotherapy. However, incision and drainage of the bone abscess was necessary.

Pneumonia.—Four of six patients with staphylococcic pneumonia, other than the one with septicemia and pneumonia mentioned previously, who were treated with sulfathiazole had a prompt reduction in fever and the duration of the disease seemed to be shortened. One patient with staphylococcic empyema was treated with sulfathiazole and no change was observed either on the temperature course or on the accumulation of fluid in the pleural space.

HAEMOPHILUS INFLUENZAE INFECTIONS

Septicemia.—Septicemia caused by a smooth virulent strain of Haemophilus influenzae has not responded to chemotherapy in my experience. Infection caused by less virulent rough strains may be effectively treated with chemotherapy alone. However, it is advisable in all cases to combine therapy with sulfanilamide and Haemophilus influenzae serum.

Meningitis.—Likewise, meningitis caused by smooth virulent strains of Haemophilus influenzae is little influenced by chemotherapy alone, whereas reports exist

3. Michels, M. W.: J. Pediat. **13**: 527 (Oct.) 1938.

of cures of meningitis caused by less virulent strains. Best results in the severe infections have been obtained by combined therapy with doses of sulfanilamide large enough to obtain spinal fluid concentrations of free sulfanilamide of from 20 to 25 mg. per hundred cubic centimeters and intravenous serum and intrathecal serum plus complement. Occasionally a dose of 4 grains (0.26 Gm.) per pound (450 Gm.) has been administered to maintain such a concentration. My experience with combined chemotherapy and Haemophilus influenzae serum has been disappointing. In the past two years I have treated ten patients with combined therapy, and the fatality rate has been 80 per cent in this group.

INFECTIONS OF THE URINARY TRACT

In the absence of marked anatomic abnormalities of the urinary tract or infections of long standing with diminution of kidney function, chemotherapy has played one of its most important parts. In fact, with the exception of mandelic acid, sulfanilamide and sulfathiazole have placed all other urinary antiseptics in the position of historical interest.

Infections Due to the Bacillus Coli Group of Bacteria.—Sulfanilamide shows its best effect in this group of organisms, which fortunately is the most common cause of infection in the urinary tract. Prompt reduction of the leukocytes in the urinary sediment and sterilization of the urine is the usual course with chemotherapy. The effective concentration of free sulfanilamide in the urine is between 75 and 150 mg. per hundred cubic centimeters. Sulfapyridine has not been as effective as sulfanilamide. However, sulfathiazole seems to be similar to sulfanilamide in therapeutic action.

Infection Due to Bacillus Proteus.—Sulfanilamide and sulfathiazole are the only chemotherapeutic agents effective in this type of infection, the chief characteristic of which is the production of a highly alkaline urine following proteolytic activity of the organism.

Infection Due to the Staphylococcus.—Sulfanilamide has not been as effective in this type of urinary infection. Unpredictable results have been obtained in treatment. Sulfathiazole seems to be more reliable as a chemotherapeutic agent in staphylococcic infection of the urinary tract.

Infection Due to Streptococcus Faecalis. — Both sulfanilamide and sulfapyridine are without value in sterilizing the urine in infections caused by Streptococcus faecalis. Mandelic acid was the only effective drug until the advent of sulfathiazole, which has given promise of producing sterilization of the urine when the infecting organism is Streptococcus faecalis.

BRUCELLA INFECTIONS

Reports are at variance on the effect of sulfanilamide on undulant fever. My experience has been limited to a group of three patients in the acute stage of the disease when Brucella abortus could be cultured from the blood. In this small group of patients the sulfanilamide had no demonstrable effect on either the temperature or the course of the disease.

TYPHOID-DYSENTERY INFECTIONS

I have been unable to find any change in the symptoms or course of typhoid with the usual dose and blood levels of sulfanilamide or sulfapyridine. In dysentery caused by the bacilli of Sonne and of Flexner, sulfanilamide or sulfapyridine had no effect on the fever, course of the disease or cultures of the stool. I have had no experience with sulfathiazole in these infections.

TRACHOMA

Sulfanilamide has been found to have a favorable effect on trachoma in bringing about an amelioration of symptoms and allowing healing to take place. My experience has been small but agrees with that of others as reported in the literature.

INFECTIONS IN WHICH CHEMOTHERAPY IS CONTRAINDICATED

Rheumatic Fever.—It has been adequately proved that sulfanilamide has no effect on rheumatic infections, and in fact exacerbations of the disease have been observed during administration of sulfanilamide.

Diphtheria.—This should be emphasized because of the common and desirable practice of administering sulfanilamide to patients with throat infections. One should not forget to culture material from these throats for the presence of Bacillus diphtheriae before starting chemotherapy and to administer diphtheria antitoxin if such an infection is present. There is a certain amount of evidence that sulfanilamide may be destructive to the diphtheria bacillus but that it has no effect on the toxin, and disastrous complications such as neuritis or myocarditis may occur later if antitoxin is omitted.

Virus Infections.—There is sufficient evidence to conclude that the sulfonamide compounds have no effect on infections caused by a filtrable virus such as the common cold, epidemic influenza, poliomyelitis and the exanthemas measles, chickenpox and smallpox.

DOSAGE AND METHODS OF ADMINISTRATION

Certain general principles concerning chemotherapy need to be emphasized. In all cases it is desirable to know the body weight and calculate the dosage on this basis. It is usually advisable to initiate treatment with a dose larger than any of the maintenance doses. A favorable response to therapy will usually occur within two to four days from the onset of chemotherapy, and prolonged medication in the hope of a delayed response has little to be desired.

The full dose of the drug selected should be administered for approximately forty-eight hours after a favorable response has been obtained. The dose should then be halved and maintained for a period of two or three days before the drug is discontinued. Recurrence or spread of infection is most likely to be averted if this plan is rather strictly adhered to.

I have not administered alkali with any of the sulfonamide compounds for the past two years, except with sulfanilamide for the treatment of urinary infections to maintain the urine alkaline throughout the period of chemotherapy. The results of my studies of the carbon dioxide power and the p_H of the blood of patients presenting hyperpnea during chemotherapy concur with the conclusions of Hartmann [4] that acidosis does not result from chemotherapy and that the routine administration of alkali with the sulfonamides is unnecessary. Alkalization of the urine of patients with urinary infection does not appear to be necessary if sulfathiazole is administered.

Nausea and vomiting following the oral administration of the sulfonamides has occasioned little difficulty in my experience. I have administered the drugs to infants by crushing the tablets in a small quantity of fluid and feeding by a teaspoon, and to children by the same method or by feeding the whole tablet with small quantities of sweetened fluids. Significant blood concentrations of the drugs have been observed even in the

4. Hartmann, A. F.: Ann. Int. Med. **13**: 940 (Dec.) 1939.

presence of some vomiting, and unless the vomiting was continuous and severe chemotherapy was not discontinued. Frequently the vomiting was relieved by omitting the drug for one or two doses rather than discontinuing it.

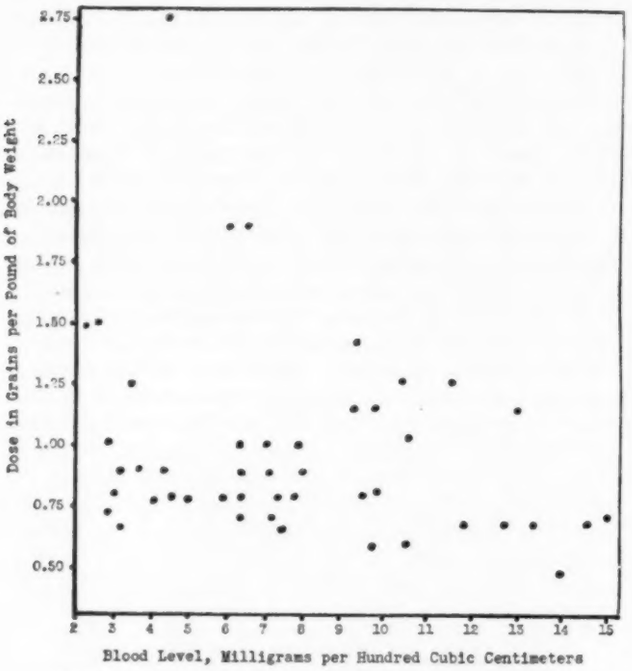


Chart 1.—Relation of dose of sulfanilamide to blood level.

I have observed that the height of the blood level does not always have a direct relationship to the size of the dose during administration of both sulfanilamide and sulfapyridine. The charts show the average blood concentrations for "free" sulfanilamide and sulfapyridine compared to the daily dose of the drug. Estimations of the blood concentration of the drugs are

TABLE 2.—*Sulfanilamide: Desirable Blood Level from 8 to 12 Mg. per Hundred Cubic Centimeters*

1. Oral
Initial: One-half grain per pound (maximum 60 grains)
Maintenance: 1 to 1½ grains per pound in 24 hours in 4 to 6 doses (maximum 120 grains)
2. Subcutaneous: 0.8% in 0.85% saline solution
Initial: 5 cc. per pound (maximum 500 cc.)
Repeat: 3 to 5 cc. per pound at 8 to 12 hour intervals
3. Intravenous and intrathecal: 0.8% in 0.85% saline solution
Intravenous: Dilute with equal parts 10% dextrose or 0.85% saline solution (maximum 3 cc. per pound in 24 hours)
Intrathecal: 5 cc. less than volume of spinal fluid withdrawn

therefore desirable in order that the dosage may be properly adjusted.

Tables 2 and 3 outline the dosages of the drugs which are most frequently followed and the methods of administration of sulfanilamide, sulfapyridine and sulfathiazole.

TOXIC MANIFESTATIONS

Cyanosis.—Sufficient evidence has accumulated to prove beyond question that the cyanosis encountered during chemotherapy is due to the formation of methemoglobin and rarely sulfhemoglobin. For the past eighteen months at the Children's Hospital of Michigan it has been a routine procedure to obtain total hemoglobin, methemoglobin and sulfhemoglobin estimations simultaneously with the estimation of the drug concentration on the same micro blood sample by means of the photoelectric colorimeter. Ninety per cent of all patients receiving either sulfanilamide, sulfapyridine or sulfathiazole have had amounts of methemoglobin varying from 0.5 Gm. to 3 Gm. The largest amounts have been observed in cases in which sulfanilamide was given. In addition, 5 per cent of all patients receiving the drugs have had approximately 0.5 Gm. of sulfhemoglobin in their peripheral blood samples. The amount of methemoglobin has rarely occasioned concern and was readily controlled by the administration of methylene blue orally or intravenously. This simple procedure may be indicated in cases in which there is a low total hemoglobin or in cases in which a general anesthesia is contemplated.

TABLE 3.—*Sulfapyridine or Sulfathiazole: Desirable Blood Level from 4 to 8 Mg. per Hundred Cubic Centimeters*

1. Oral
Initial: One-fourth grain per pound (maximum 45 grains)
Maintenance: 1-1½ grains per pound in 24 hours, in 4 to 6 doses
2. Intravenous: Sodium sulfapyridine 5% in sterile distilled water
Sodium sulfathiazole 5% in sterile distilled water
Initial: 1.25 cc. per pound (maximum 100 cc.)
Repeat: 1.25 cc. per pound at 12 hour intervals, sodium sulfapyridine 1.25 cc. per pound at 8 hour intervals, sodium sulfathiazole
3. Rectal: 5% sodium salt in sterile distilled water
Dose: 2-3 cc. per pound in 24 hours, divided in 4 to 6 rectal taps

Blood Destruction.—Acute hemolytic anemia and granulocytopenia have rarely been observed by me, although reports of a considerable incidence of hemolytic anemia exist in the literature. If either of these manifestations occurs, the drug should be stopped at once and proper corrective measures instituted, such as to increase the fluid intake and the giving of blood transfusions. Free use of transfusions of blood is a common practice in most hospitals for infants and children, which

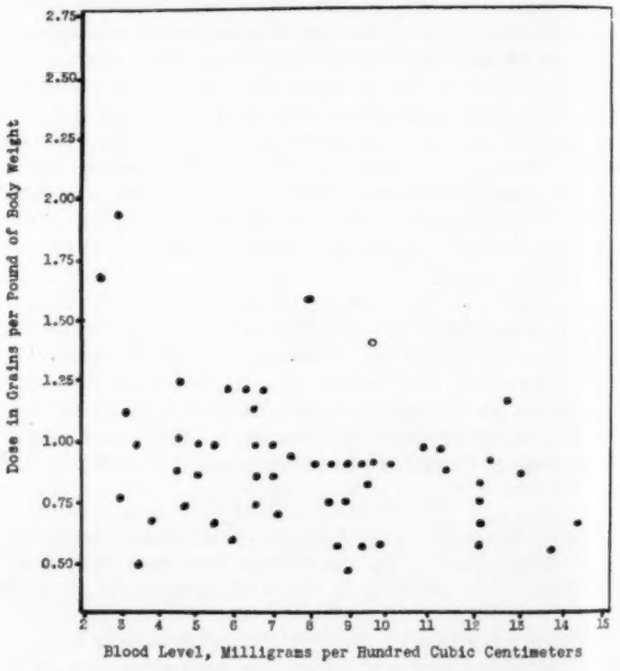


Chart 2.—Relation of dose of sulfapyridine to blood level.

may explain the relatively low incidence of manifestations of blood destruction in this age group.

Nausea and Vomiting.—Nausea and vomiting have been encountered less frequently in chemotherapy in pediatrics than in adult practice. Sulfapyridine has produced more difficulty than sulfanilamide, but nausea and vomiting have rarely been observed in sulfathiazole therapy. In fact, patients have tolerated sulfathiazole

when previously sulfanilamide or sulfapyridine produced intense vomiting.

Cerebral Symptoms.—Headache, depression, confusion or manic states are rare in infants and children receiving chemotherapy. Occasionally in the older child a temporary depression has been observed, but rarely has it been severe enough to warrant withdrawal of the drug.

Hematuria.—Urinary concretions of acetylsulfapyridine and hematuria have been observed in cases in which sulfapyridine is being given. The incidence has been less than 1 per cent, and permanent kidney dysfunction is rare. Acetylsulfathiazole crystals and hematuria have been observed during administration of sulfathiazole.

Hepatitis and Jaundice.—A few cases of hepatitis and jaundice have been observed during chemotherapy in infants and children.

Fever and Rashes.—Fever as a toxic manifestation to chemotherapy has been observed in about 1 per cent of infants and children. Usually it has not been difficult to distinguish the fever from that accompanying the infection. It has been suggested that fever may be a forewarning of a severe toxic reaction and discontinuance of chemotherapy is advisable. I have not observed this. Various types of rashes have been observed as a reaction from all the chemotherapeutic agents. These have included morbilliform types, a diffuse erythema, urticaria and, more recently, a rash resembling erythema nodosum, as described by Haviland and Long,[5] has been observed during therapy with sulfathiazole.

If any of the following toxic manifestations are encountered, the drug should be immediately withdrawn: acute hemolytic anemia, granulocytopenia, purpura, hepatitis and jaundice.

Unless the infection for which the drug was prescribed has not been controlled, it is advisable to discontinue therapy if any of the following toxic manifestations appear: hematuria, severe nausea and vomiting, drug fever and rashes.

PROPHYLAXIS

Surgery.—Reports of the prophylactic use of the sulfonamides in pediatric surgery are few. A few pertinent suggestions may be made for the application of this practice.

The prophylactic use of sulfanilamide prior to tonsillectomy may be considered. If a tonsillectomy is contemplated during the late convalescent stage of scarlet fever the administration of sulfanilamide before and after the operation may prevent invasion and complications from the beta hemolytic streptococcus. Tonsillectomy on patients with rheumatic infections occasionally results in a disastrous invasion by the beta hemolytic streptococcus and exacerbation of the rheumatic process. The prophylactic use of sulfanilamide as a preoperative and postoperative measure is worthy of consideration.

During the winter months when the incidence of respiratory infections is high in any children's hospital, pneumonia is occasionally an undesirable postoperative complication of both emergency and elective surgical procedures. The routine administration of sulfapyridine or sulfathiazole as part of the postoperative therapy may be seriously considered in the hope that postoperative pneumonia may be prevented.

5. Haviland, J. W., and Long, P. H.: Bull. Johns Hopkins Hosp. **66:** 313 (May) 1940.

Rheumatic Infections.—Two reports have appeared[6] on the prophylactic administration of small daily doses of sulfanilamide (from 10 to 15 grains, or 0.65 to 1 Gm.) to patients with rheumatic infections to prevent beta hemolytic streptococcus infections of the upper respiratory tract, with which there is so frequently an exacerbation of the rheumatic process. More experience is needed to evaluate this procedure thoroughly, but it deserves consideration.

Miscellaneous.—The prophylactic administration of the sulfonamides during epidemics of beta hemolytic streptococcus infections of the throat, epidemics of scarlet fever and epidemics of meningococcic meningitis has been suggested but no wide experience with this procedure has been reported.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—*In their elaboration, these articles were submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, the late Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. When completed, the series will be published in book form.*—ED.

THE THERAPY OF ACUTE DELIRIUM (TOXIC PSYCHOSIS, FEVER PSYCHOSIS, INANITION PSYCHOSIS)

IN COLLABORATION WITH S. H. KRAINES, M.D.

Under this heading will be discussed acute symptomatic delirium, which is a more or less temporary condition of disorientation usually accompanied by hallucinatory states and often by a predominant affect of fear. It is due to disturbance in the metabolism of the brain, be this from toxemia, inanition or edema—of a reversible type so that complete recovery may occur. The therapy of delirium is the most frequent psychiatric problem facing the physician, no matter whether he is in general or in special practice. As delirium is in itself a danger to life, not only to the patient himself but also to his attendants, and as it greatly increases the patient's suffering and the difficulty of treatment and beclouds the prognosis, every effort should be bent on its early recognition. In early stages deliriums are often preventable or can be greatly ameliorated and the danger to life and limb much diminished.

One must guard against delirium in all cases of fever and of inanition, in cardiovascular and renal disorders most especially when there is edema or nitrogen retention, in cases of head injury, in cases with acute impairment of the sensory apparatus (vision or hearing) and in cases in which drugs disturbing brain function have been administered, whether bromide, opiate, hypnotic or anesthetic, and in alcoholic addicts suffering from any sickness whatever. Indeed, every chronic alcoholic addict who is seriously sick in any way or who has sustained an accident presents a potential case of delirium tremens. That he is on the verge of delirium may be assumed by the finding of tremor, apprehensive-

6. Thomas, Caroline B., and France, Richard: Bull. Johns Hopkins Hosp. **64:** 67 (Jan.) 1939. Coburn, A. F., and Moore, Lucile V.: J. Clin. Investigation **18:** 147 (Jan.) 1939.
Dr. Fantus died April 14, 1940.

ness and motor restlessness even without the occurrence of visual or auditory hallucinations.

Whether a patient does or does not develop delirium depends on (*a*) the severity of the toxemia or malnutrition and (*b*) the constitutional and emotional stability of the patient at the time of illness. Patients under emotional tension may develop delirium from relatively slight causes.

DIAGNOSIS

1. *Mental Symptoms.*—Deliriums tend to involve primarily the intellectual function. This is in contradistinction to the relative intactness of this function in schizophrenic and manic-depressive psychoses. The intellectual functions include orientation as to time, place and person, memory for recent and remote events, general information, ability to calculate and ability to use an adequate amount of judgment. Here again it must be remembered that these functions can be evaluated only in the light of the individual's ability before the psychosis began. The memory may be poor, calculation inefficient and judgment inadequate, and still the individual may not be delirious but may be feebleminded or uncooperative.

The involvement of the higher intellectual functions results in a release of the more primitive mental functions, so that in these psychoses the basis personality which is ordinarily masked by inhibitions and conditioned experience tends to come to the fore almost in proportion to the degree of involvement of the cerebral cortex. It is for this reason that the various deliriums present such a wide variation in picture. The same basic pathologic condition may manifest itself in one patient as a euphoric manic illness. Another patient with this disease may be depressed; still others will present delusions of persecution and will simulate typical dementia praecox. Not infrequently these patients show a simple dementia with no particular mood change. The symptoms in themselves may vary from the muttering restlessness of the typhoid patient to that of the violent agitation and hallucinosis of the acute alcoholic addict. Often there are sleeplessness, headache, dizziness, terrifying dreams, drowsiness, incoherent statements, dull comprehension, incontinence, misidentification and forgetfulness. Marked apprehensiveness is common and may be associated with hallucinations.

2. *Signs.*—These are most important from the standpoint of differentiation of acute symptomatic delirium from chronic delirium or the psychoses of dementia paralytica, cerebral arteriosclerosis, brain tumor or cerebral syphilis and the paranoic and paranoid delusional states.

In the acute deliriums associated with other organic illnesses or fevers the patient presents the symptoms due primarily to the basic disease. The typhoid patient, the pneumonia patient, the patient with septicemia all these show the usual signs of their illness and must be treated in accordance with the underlying disease. The phenomena of advanced heart or kidney disease, of marked disturbance of the autonomic nervous system or of metabolism—be this cachexia, acidosis, alkalosis or avitaminosis, e. g. pellagra—are evident to one who looks for them, as are the characteristic signs of drug intoxication, such as alcoholism, atropinism, bromism or barbiturate poisoning.

3. *Laboratory Observations.*—The clinical examination of the delirium patient should include not only routine procedures such as urinalysis and blood count but also spinal puncture to determine the nature and tension of the cerebrospinal fluid and special tests for drugs when those are suspected of causing the condition.

The therapy may be discussed under the headings prophylactic and causal treatment, symptomatic treatment; hypohydration treatment in cerebral edema cases, e. g. delirium tremens, and psychotherapy.

PROPHYLACTIC AND CAUSAL TREATMENT

When one realizes the fact that intoxication and exhaustion in addition to hyperpyrexia are the underlying causes of delirium, it will readily be seen that the prophylactic and the causal therapy of delirium are identical. It includes chiefly the following items:

1. Prevent hyperpyrexia (see Fever Regimen) because high temperature no matter how induced tends to produce delirium.

2. Avoid increasing the toxicosis by giving deliriant drugs and those that may interfere with the proper nutrition of the brain. The latter liability is particularly great with bromide, which should be considered contraindicated in all grave nutritional disturbances of the cerebrum, such as the delirium occurring in the later stages of typhoid. The action of bromide may be visualized as due to the bromide ion going into partnership with the chloride ion and being able to serve, almost as well as the chloride, the nutritive functions of the body with the exception of its most sensitive tissue, the nervous system. This interference with nutrition is of little consequence to the nervous system of an individual in fairly good nutritional equilibrium—excepting that it lessens irritability—unless or until about 30 per cent of the body chloride is replaced by bromide, when symptoms of intoxication are likely to supervene. In the fever patient the intoxication threshold is lower. A blood bromide of 150 mg. per hundred cubic centimeters (Wuth test [1]) may be regarded as the dangerous level, though even 75 mg. may be significant. Bromide intoxication manifests itself by drowsiness, poor memory, confusion, thick speech, ataxia, tremors and delirium. A rash (acne) may or may not be present. The symptoms may persist for weeks after the blood bromide has returned to normal.

As any one of the hypnotics is capable of acting as a deliriant when given in dose insufficient to produce sleep, one must either give no hypnotic at all or give enough to produce deep sleep.

When a patient is on the verge of delirium, it is best to stop all medicine excepting that indicated by the condition present.

3. Maintain correct fluid balance. Forcing fluid to "favor elimination" must be carried out with discretion and it is contraindicated when there is a tendency to cerebral edema. This indicates hypohydration therapy, which consists of limitation of fluid intake to 1,000 cc. for the twenty-four hours, dextrose phleboclysis of from 50 to 100 cc. of 50 per cent solution, which may be repeated every eight hours, and magnesium sulfate by mouth, 30 cc. of saturated solution. This regimen tends to prevent development of the "wet brain" found so frequently on necropsy of alcoholic addicts.

In cases then in which there is no excess of cerebrospinal pressure, one may give the patient all the fluid he will take by mouth or can retain. If this amount is inadequate to maintain liberal urinary elimination, phleboclysis (5 per cent dextrose solution) should be employed. The extent to which fluid should be forced needs to be guided by the way the kidneys respond to the appeal. As long as the quantity of the urine

1. Wuth, Otto: Rational Bromide Treatment: New Methods for Its Control, J. A. M. A. **88**: 2013-2017 (June 25) 1927.

increases, elimination may be assumed to be improved. When this limit is exceeded the forcing of fluid does harm. It then causes edema, latent or manifest, including cerebral edema, which may produce delirium.

In bromide intoxication and in all conditions of hypochloridema (q. v.) sodium chloride should be freely administered, but again only up to the point of making good the deficit and improving elimination. In bromide intoxication it is not advisable to push chloride at first or until after the blood bromide has fallen to 150 mg. per hundred cubic centimeters, as chloride administration temporarily increases the blood bromide concentration, while the elimination by the kidneys remains unaffected.

4. Maintain metabolic equilibrium to the best possible degree. This demands faithful feeding from the very inception of any serious illness. The diet must cover the most nourishment the patient can take care of. An alcoholic addict who vomits may be able to retain a cup of hot milk made "hotter" by 1 cc. of tincture of capsicum. The patient may possibly be able to take cereal gruels. It must be pointed out here that special attention should be given the administration of an abundance of vitamins, especially vitamins B and C, particularly for the alcoholic addict, as it is evident that chronic alcoholism produces subvitaminosis to the extent to which the abuse of liquor interferes with or is used as a substitute for vitamin-containing food.

The suggestion has been advanced that, in addition to a carbohydrate-high diet, from 5 to 10 units of insulin be given one hour before meals not only for improving the assimilation of the carbohydrate but also for its calming effect. One must watch the patient carefully to intercept by promptly giving sugar a hypoglycemia crisis (sweats, weakening of pulse, epileptoid attacks or increase in the delirium). Acidosis (q. v.) or alkalosis (q. v.) and hyperthyroidism (q. v.) require special management. If the hemoglobin percentage is below 50, blood transfusion is indicated.

5. Maintain optimum possible cardiorenal functions. For the indicated therapeutic tactics, should heart or kidney action be insufficient, reference must be made to the Therapy of Circulation Depression and to the Therapy of Uremia.

6. Secure an adequate amount of rest and sleep. When one realizes how exhausted a healthy person feels after even one sleepless night, it is easy to understand that it is nothing less than malpractice to permit a seriously ill patient to suffer from insomnia night after night. Sleep is as important as food in the survival period. Hence we must give our patients solicitous care to secure as much sleep as possible, day or night. The sleeping patient should not be awakened for the giving of medicines or any other treatment unless this is especially ordered by the physician. To awaken a patient for the morning toilet who, after a restless night, has at last fallen asleep (as is done in a routine manner in some hospitals) is the worst kind of nursing practice.

The measures to be used for the securing of sleep have been discussed under Therapy of Insomnia. Here it must be pointed out that a beginning delirium may possibly be aborted by a darkened room, a reassuring nurse and an ice cap plus, if necessary, an adequate dose of hypnotic such as paraldehyde 10 cc. in water by mouth or rectum. This regimen may prevent a prolonged and dangerous delirious state.

SYMPTOMATIC TREATMENT

Protection.—In all those conditions in which delirium is likely to occur, as in every alcoholic addict who is starving from the exclusive use of liquor, from vomiting or from intercurrent disease, the physician should look for tremor, reflex disturbances, changes in the patient's mental grasp and orientation, and in his feelings and sensations. The forerunners of delirium are continued insomnia, taciturnity and apathy or loquacity and nervous irritability, suspiciousness, anxiety and muscle twitching. When any of these are discovered and even in the absence of hallucinations or delusions he should promptly institute appropriate measures to keep the patient from harming himself or those around him.

This requires constant nursing care. A delirious patient must not be left alone even for a minute, and nothing with which he can harm himself or others should be within his reach. The treatment should be directed at making the patient less fearful. An efficient, tactful nurse who is able to speak quietly and soothingly usually is able to do more to prevent excessive activity than physical restraints. The patient's senses, impaired as they are by the toxic state, are unable to record accurately the various stimuli from without, and thus illusions (which are mistaken impressions) occur. This is particularly true in the early morning and late evening hours when the changes in light make it more likely for illusions to be experienced. It is during these particular times that the patients become more easily frightened and as a result agitated and restless. An understanding and reassuring nurse who knows how to dispel these unreasonable fears will often quiet the patient far more than sedative medication.

When a patient is absolutely determined to get up, it is often much wiser to allow him to sit up or even rise for the moment and then with gentle persistence to lead him back to bed than to have him expend a great deal more energy by struggling against the restraining persons, sheets or straps. Patients become covered with perspiration, increase their temperature and become exhausted by such struggling, using more energy than they seem to possess. It is much less exhausting for such patients, when in their anxiety, if they are allowed to sit up or even get up for the moment until their weakness causes them to relax.

The windows of all rooms in which such patients are kept should be properly guarded, since accidental suicides are not uncommon among delirious patients. The doors must be barred, since such patients may run away even as they are in their night clothes. The ideal treatment for all delirious patients is their prompt transfer to the psychopathic department or to a ward properly equipped for the care of these temporarily psychopathic patients.

Hydrotherapy is of great value, especially for the alcoholic addict. The secret of its success lies not only in the specific soothing and relaxing effect of the warm water but also in the fact that the patient is comfortable while in the bath and uncomfortably chilly the moment he tries to get out of it. Sometimes an ordinary tub bath of warm (not hot) water (never over 100 F.) for half an hour will work wonders in quieting a patient. Still better is the prolonged or continuous neutral bath with water between 96 F. if there is fever and 98 F. if there is no fever. The temperature of the water should always be a little lower than the body temperature to allow for the escape of heat from the body. These tub baths should be tried as a rule before giving sedative medication, if the condition of the patient, e. g. surgical wounds, does not contraindicate it. The medicinal sedatives are substances foreign to the human body not entering into its anabolic processes. They are poisons which must be eliminated by the emunc-

tories overstrained by the poisons already present. Often medication actually aggravates the delirium. In properly equipped "continuous bath" tubs it is possible to keep a patient for eight hours or longer. In such baths the temperature must be constantly checked and recorded so as to avoid chilling or scalding. While the patient is in the tub he should have an ice bag on his head and be given frequent sips of water. The room should be darkened, warm and quiet.

Another useful form of hydrotherapy is the "cold wet pack." The patient is placed on a table and wrapped in a sheet which has just been wrung out in water of about 65 F. and immediately afterward wrapped in warm blankets outside the sheet. The sheet will absorb much of the body temperature and the reacting warmth often has a strong soothing effect. The covering blanket may be retained after half an hour or removed, always depending, as in everything else, on the thermic and circulation reaction of the patient.

Physical restraint should be avoided if it is at all possible to get along without it. The patient moves about and acts irrationally because of the disturbed condition of his brain. Restraint causes most individuals to become antagonistic and thus more agitated and it adds to their baseless fears and actually motivates them to further activity.

Where there is insufficient help a restraining sheet may have to be used, passed across the patient and wound around the bars of the bed. Side boards, well padded to avoid bruises, are often adequate for these restless persons. The wrist and ankle straps at present in general use in many hospitals are a relic of the barbarous past, necessary as long as adequate segregation and humane protection of these patients cannot otherwise be secured. Their employment should be abolished as soon as possible. They irk the patient so much that the first thing many of them shout to any one approaching is "Say, got a knife? Cut them straps!"

Sedative Medication.—Attempts are often made to quiet patients who are delirious with all sorts of medicine, yet nothing of value is usually accomplished. The harm that comes to a patient by yelling is little when compared with the possible toxic effect of a medication that may not only fail to quiet but may actually make the patient worse. In many hospitals there is no proper provision for such noisy persons and quiet must be obtained for the other patients present. Ice bags to the head, hydrotherapy and an intelligent nurse may be able to accomplish this. If this fails, sedatives may have to be resorted to. Their use, like that of physical restraints, then becomes a necessary evil.

If absolutely demanded by the patient's need of rest, hypnotic drugs should be given only for the night, when the patient is more apt to be disturbed, and they should be administered before darkness sets in, since the latter may increase the patient's disorientation and fear. The dose must be large enough to cause sleep, and a quick acting readily metabolized and eliminated drug should be chosen.

Paraldehyde meets these requirements more nearly than any other drug. The effects set in within ten to fifteen minutes and it does not depress heart and respiration. Its toxicity is so low that 100 Gm. merely produces very prolonged sleep. It is only when the patient is under the influence of an almost fatal dose of alcohol that its administration may be dangerous, as it acts in the same way as alcohol. Its chief disadvantage is the disagreeable odor and taste and its local irritative quality. The dose in delirium is from 10 to 15 cc. given in ice water, tea or wine. Its taste is partly disguised by compound spirit of orange (prescription 1). It may be administered by rectum (prescription 2).

Amytal sodium may be given intravenously to patients who do not respond sufficiently well to paraldehyde. It should be injected at the rate of 0.1 Gm. a minute and a dose of from 0.5 to 1 Gm. should not be exceeded. It is obtainable in ampules containing this quantity of the salt and accompanied by an ampule containing ten times the amount of sterile distilled water in which it is to be dissolved just before administration.

PRESCRIPTION 1.—*Paraldehyde and Compound Spirit of Orange*

℞	Paraldehyde	40 cc.
	Compound spirit of orange	10 cc.

Tablespoon in iced tea to be followed by teaspoon doses hourly until patient is asleep.

PRESCRIPTION 2.—*Paraldehyde and Alcohol*

℞	Paraldehyde	40 cc.
	Alcohol	40 cc.

One fourth the quantity (20 cc.) in 100 cc. of physiologic solution of sodium chloride, to be given as retention enema. To be repeated in an hour if necessary, then every two to four hours as required.

Should it be undesirable to administer either of these, one might consider the possibility of synergistic medication to obtain possibly maximal sedation with a minimum of undesirable side effects. It has been customary in this hospital to give a mixture the essential ingredients of which are Chloral Hydrate (0.3 Gm.) and Tincture of Hyoscyamus (0.05 cc.) with Morphine Sulfate (1 mg.) per dose. It may be doubted that the small dose of morphine adds anything to the effect of the medicine. There are many who consider morphine in sufficient dosage to quiet the patient distinctly dangerous to delirious patients, especially to alcoholic addicts, many of whom become excited by it. It is contraindicated in delirium tremens, as it tends to raise intracranial pressure. It increases reflex excitability, which is generally excessive in these patients. The combined use of morphine with barbiturate is especially to be avoided, as it may cause the patient to "forget to breathe" on account of summation of depressant action on the respiratory center. The elixir of chloral and phenobarbital (prescription 3) contains in each teaspoon one half the average official dose of each ingredient in a relatively palatable form. It might be given in tablespoon doses (15 cc.) in water to be followed by hourly teaspoon dosage until the desired effect is obtained.

PRESCRIPTION 3.—*Compound Elixir of Chloral and Phenobarbital*

℞	Soluble saccharin	0.05 Gm.
	Chloral hydrate	6.00 Gm.
	Soluble phenobarbital	0.50 Gm.
	Fluidextract of hyoscyamus	2.00 cc.
	Elixir of eriodictyon (R. B. II)	100.00 cc.

Tablespoon (15 cc.) in water as first dose, to be followed by hourly teaspoon dosage until the patient is asleep. (Hypnotic in delirium.)

HYPOHYDRATION TREATMENT

Hypohydration treatment is indicated for reduction of intracranial edema and excessive cerebrospinal fluid pressure occurring in delirium tremens as well as in some other forms of delirium. It includes:

1. Spinal drainage of from 50 to 75 cc. of fluid. This may be repeated after an interval of from six to twelve hours. The fluid must be permitted to escape very slowly.

2. Phleboclysis of sucrose solution 50 per cent; from 100 to 200 cc. or even 500 cc. may be repeated every six to twelve hours alternating with the spinal drainage.

3. Magnesium sulfate 60 cc. of a saturated solution should be given by mouth every morning.

4. Fluid should be limited to 1,000 cc. in the twenty-four hours with the most liberal possible supply of carbohydrate and vitamins.

5. Favor diuresis by caffeine with sodium benzoate 0.5 Gm. given intramuscularly every four hours as long as required. Digitalis and other cardiovascular stimulants may be given as indicated.

PSYCHOTHERAPY

If the delirium develops in a relatively nontoxic condition, one should study the patient's personality to prevent and ameliorate disturbing emotional factors. Many convalescences are prolonged when all traces of organic disease have gone and restorative processes should have been completed, simply because the patient has developed a neurasthenic syndrome precipitated by the physical illness and he is now activated by the disturbing emotions that were latent for a long period before the illness.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

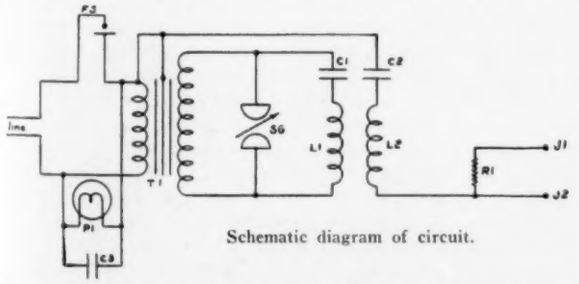
DRIFLASH ELECTRO-SURGICAL UNIT ACCEPTABLE

Manufacturer: General Automatic Corporation, Macedonia, Ohio.

The Model C-100 Driflash is a spark gap electrosurgical unit intended for desiccation and fulguration by the monopolar technic only. The unit is housed in a molded plastic case with a hanger so that it may be hung on the wall. A foot switch operates the unit, and a pilot light indicates when it is energized.

Driflash Electro-Surgical Unit.

The following information was submitted by the firm: A high voltage transformer supplies 1,500 volts on an open circuit; the spark gap points are of tungsten; the coil assembly is wound on a fiber form; the condenser assembly is a copper mica assembly between aluminum castings. Two outlet jacks are provided. Both the condenser and the coil assembly are insulated for voltages at least five times higher than those actually encountered. The power output is approximately 10 watts.



Schematic diagram of circuit.

In the advertising no therapeutic claims are made for the device other than that it is a suitable device for desiccation and fulguration. The Council's clinical investigation of the unit revealed that it gave satisfactory service.

Assuming that only treatment of small lesions of the skin is to be undertaken and that only monopolar technic is desired, the intensity of fulguration and desiccation is adequate for practical purposes. The control whereby one can reduce the intensity from maximum power down to a point at which there is no effect seems quite even and satisfactory.

The Council on Physical Therapy voted to accept the Driflash for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. PAUL NICHOLAS LEECH, Secretary.

HAZARDS OF BROMIDISM IN PROPRIETARY AND UNCONTROLLED HYPNOTIC MEDICATION: NEUROSINE (Dios Chemical Company) NOT ACCEPTABLE FOR N. N. R.

Lately the medical profession has been deluged with pamphlets extolling the value of bromides over the barbital preparations. These pamphlets have been sent out by the Dios Chemical Company, promoters of "Neurosine." An introductory paragraph of one of the pamphlets states:

> In prescribing sedative medication, the physician is faced with the problem of selecting the most suitable, yet safe, agent. Shall he choose one of the barbiturates, which though they have a powerful, prompt hypnotic effect, are known to be dangerous and with distinct tendencies toward inducing tolerance and addiction? Or, shall he rather choose a milder sedative of certain action, with decades of safe, effective clinical application, such as a tested combination of bromides with therapeutic adjuvants (Neurosine)?

The author of the article is stated to be Dr. Frederic Damrau, who makes his services available to quite a number of proprietary concerns. In view of this, the Council calls the attention of the medical profession again to the hazards of bromidism in their indiscriminate use in hypnotic medication.

In the consideration of the use of any drug there are two aspects of its toxic action that must be considered: first, the acute toxicity and, second and often more important, the chronic toxicity. The acute toxicity can be readily gaged by determination of the acutely fatal dose in animals and comparison of this with the dose necessary to bring about the desired pharmacologic action, thus obtaining the therapeutic index. With due allowance for species differences, these results may be applied to the use of the drug in man. Chronic toxicity may be due to either or both of two characteristics: first, to slow progressive damage to some organ or its function, because of a long continued maintenance of a concentration of the drug that would not produce irreversible changes in a short time and, second, to slow excretion or destruction of the drug, with the resultant attainment of a very high level in the body after prolonged administration. The bromides fall into the latter category, and it is because of this factor that their indiscriminate use such as in proprietary sedatives has led to so many cases of chronic bromide intoxication.

BLOOD BROMIDE AND INTOXICATION

The use of bromides as depressants of the central nervous system dates back a century, and it was not long after their introduction that the first case of intoxication was reported by Huette[1] in 1850. There followed reports of individual cases from time to time, but it was not until Wuth[2] called attention to the syndrome in 1927 and described his modification of the methods of determination of blood bromide previously described by Walter and Hauptmann that the subject was given adequate attention, and reports of the incidence of chronic bromide intoxication were forthcoming. Wuth reported elevated blood bromide values in 21 per cent of 238 patients admitted to the Henry Phipps Psychiatric Clinic, of whom 8 per cent showed clinical evidence of bromide intoxication. Probably the largest series of cases was reported by Wagner

1. Kamman, G. R.: Minnesota Med. **21**: 484 (July) 1938.
2. Wuth, Otto: Rational Bromide Treatment, J. A. M. A. **88**: 2013 (June 25) 1927.

and Bunbury, who found 7.7 per cent of patients admitted to the Colorado Psychopathic Hospital to have blood bromide concentrations above 75 mg. per hundred cubic centimeters, with 4.4 per cent showing symptoms of bromide intoxication. Hanes and Yates [3] found that more than 700 patients admitted to Duke Hospital had elevated blood bromide concentrations, of whom 400 had had concentrations above 50 mg. per hundred cubic centimeters over a period of six and one-half years, during which time they represented 0.9 per cent of total admissions. Of 500 dispensary patients, 5.8 per cent had blood bromide concentrations above 50 mg. It is the opinion of these authors that 5 per cent of admissions to institutions are due to bromide intoxication.

BEHAVIOR OF BROMIDE IN THE BODY

In order to understand the high incidence of intoxication with this drug, one must consider briefly its behavior in the body. The bromide ion is readily absorbed from the stomach and intestine, to such an extent that even after the ingestion of large amounts very little is found in the feces. The absorbed bromide is capable of displacing chloride from the tissues, the amount so displaced depending on the relative amounts of the two halides ingested. Thus either an increase in bromide or a decrease in chloride ingested results in a rise in the bromide concentration in the tissues. Normally, the chloride concentration is maintained within fairly narrow limits, the absorption being balanced by urinary excretion. Because bromide is excreted more slowly than chloride, even though the amount of bromide ingested is inferior to the amount of chloride, bromide will gradually replace chloride in the tissues. It is estimated that for every gram of bromide ingested from 10 to 15 Gm. of chloride should be taken and that with this ratio there is little danger of cumulative toxicity.[4] Replacement of 40 per cent of tissue chloride by bromide is stated by Bernouilli [5] to be fatal and 30 per cent definitely toxic.

FACTORS IN BROMIDE TOXICITY

Thus it is seen that a number of factors other than the absolute dose of bromide are concerned in the possible development of bromide intoxication. A reduction of chloride in the diet is effective in increasing blood bromide concentration on a constant bromide intake, while kidney damage, by interfering with bromide excretion, may have the same effect. Added to this is the generally accepted fact that the threshold of toxicity varies greatly from one individual to another, much as is the case with alcohol. It may be stated that any blood bromide concentration above 150 mg. per hundred cubic centimeters carries with it the possibility of bromide intoxication, although cases have been reported in which as high a concentration as 380 mg. per hundred cubic centimeters was tolerated without untoward symptoms.

FALSE SENSE OF SECURITY IN LOW ACUTE TOXICITY

Probably the very low acute toxicity of bromide is responsible more than any other factor for the high incidence of bromide intoxication. The knowledge that very large single doses may be taken without other effect than the desired sedation has led to a false sense of security on the part of layman and physician alike in the prescribing of bromides, the name of which has become a household word synonymous with mild sedation. Nor has this dangerous sense of security been decreased by the publication in the medical literature [6] and in the advertisements of certain drug firms [7] of data emphasizing the low acute toxicity of bromides, without adequate consideration of their cumulative action.

A striking example of the latter type of publication is a pamphlet circulated by the Dios Chemical Company of St. Louis, advertising their product "Neurosine" entitled "Do Sedatives Harm the Brain," under the authorship of Frederic Damrau, copyright 1939. Probably the most objectionable phase of the claims made in this publication lies not in the virtues attributed to "Neurosine" but rather in the lack of appreciation of the cumulative effects of continued bromide medication. Certain of the statements made are worthy of comment. Great stress is laid on the lack of acute toxicity of bromide, the statement of Cushny being quoted that "acute fatal poisoning has seldom or never occurred in man." In contrast to this, the whole subject of cumulative toxicity is disposed of in a short paragraph, the definite impression being given that the incidence of such toxic effects is negligible and the treatment simple and rapidly effective, than which nothing could be less true. Damrau further states "The bromides are never habit forming," yet cases of addiction to "Bromo-Seltzer" have been reported. Importance is attributed to animal experimentation, autopsies of the experimental animals being claimed which "failed to show any pathological changes of the brain, heart, lungs, kidneys or spleen." Yet a careful perusal of this work shows that only acute experiments were performed in which no opportunity for cumulative action was present. Nevertheless, in the next paragraph the indications for the administration of "Neurosine" include such essentially chronic conditions as "neurasthenia, hysteria, menopause neuroses, alcoholism, the insomnia habit, and epilepsy." The applications of "Neurosine" seem endless, as a later paragraph gives unqualified commendation for its use in Sydenham's chorea, habit spasms and exophthalmic goiter, but in all these conditions more specific treatment is certainly indicated. Superiority over barbituric acid derivatives is claimed on presentation of fragments of evidence, mostly original with Damrau, without adequate presentation of the other side of the case. Finally, a plea is made that "Neurosine" be prescribed because it is "strictly an ethical preparation," a plea which loses something in sincerity when it is remembered that the Dios Chemical Company goes to considerable trouble and expense to see that the preparation is dispensed in the original bottle, which has both the name "Neurosine" and the name of the firm blown into the glass, thus affording the patient an excellent opportunity for continued self administration of a potentially dangerous drug.

Furthermore, the stress placed on the undesirable features of barbiturates is out of all proportion in Damrau's discussion of the action of bromides. Every physician will agree that there are undesirable side actions of the barbiturates which are well understood and documented, but it is quite inappropriate in a discussion of sedative drugs to single out this particular group for condemnation while minimizing, or even ignoring, more or at least equally glaring faults in other groups of drugs, especially the bromides. Although the obvious purpose of advertisements is to sell the product advertised, such an attempt based on part information and misinformation is misleading to the profession and the public and should be condemned.

The recent legislation aimed quite justifiably at the indiscriminate sale of the barbiturates has resulted in increasing the equally undesirable indiscriminate and unhindered sale of preparations containing bromide. That ignorance regarding the potential danger of prolonged administration of bromide without adequate supervision is not restricted to the layman is eloquently attested by the number of patients referred to psychiatrists by physicians who have themselves administered bromides to a point of chronic intoxication which they failed to recognize. Furthermore, Tod and Stalker [8] report three physicians admitted to Maudsley Hospital for bromide intoxication due to self medication. Is it, then, any wonder that the layman, unaware of the potential danger of the drug, having as a matter of common knowledge the impression that bromides are "good for the nerves" and having the choice of any number of attractively dispensed proprietary preparations which he may purchase with no more restriction than is placed on the sale of cosmetics, all too frequently finds himself ultimately in a psychiatric institution? Surely the remedy does not lie merely in the printing of the composition of the product on the label, for so far as bromides are concerned this is rather an added inducement for the buyer, but rather in placing similar restrictions on the sale of these preparations as have

3. Hanes, F. M., and Yates, Anne: South. M. J. **31**: 667 (June) 1938.
4. Barbour, R. F.: Proc. Roy. Soc. Med. **29**: 1391 (Sept.) 1936.
5. Bernouilli: Arch. f. exper. Path. u. Pharmakol. **73**: 355, 1913.
6. Damrau, Frederic: M. Rec. **144**: 239 (Sept. 2) 1936.
7. Damrau, Frederic: Do Sedatives Harm the Brain? St. Louis, Dios Chemical Co., 1939.
8. Tod, Henry, and Stalker, Harry: Edinburgh M. J. **45**: 561 (Aug.) 1938.

already been placed on the sale of the barbiturates. Finally, the education of the medical profession to the proper use and control of bromide medication is important.

PROPER CONTROL OF BROMIDE MEDICATION

Although there is some divergence of opinion as to the relative value of bromide in the treatment of epilepsy, since the advent of phenobarbital and dilantin sodium, the drug is undoubtedly effective in certain cases and probably deserves some usage in this condition. It is a useful adjunct to the therapeutic armamentarium also as a mild sedative in certain neuropsychiatric conditions. Nor need its use be unduly hazardous if its potentialities for cumulative toxicity are borne in mind and adequate precautions are taken. These precautions consist essentially in a control of the level of the bromide concentration of the blood, endeavoring to attain the desired therapeutic result with as low a concentration as possible, and absolutely avoiding concentrations higher than 125 to 150 mg. per hundred cubic centimeters. The determination of bromide concentration of the blood by the method described by Wuth [2] is simple and rapid and the apparatus required is inexpensive. Therefore, it is not unreasonable to ask that, if the physician is not willing to undertake the slight effort and inconvenience required to follow the blood bromide concentration, he should eschew the prescription of the drug entirely and confine himself to such sedative drugs as have been proved to be relatively noncumulative. If bromides are prescribed, the pharmacist should be advised not to refill the prescription without an order to do so, thus avoiding the danger of the patient's continuing the medication without supervision. If these precautions are adhered to, there is no reason why therapeutic use of this sedative should result in bromide intoxication.

MANIFESTATIONS OF BROMIDE INTOXICATION

As to the manifestations of bromide poisoning, suffice it to say that any organic reaction type may be simulated. However, in the majority of cases there are the signs of a toxic delirium, with retardation of thought, slurred speech, ataxia, tremulousness of the hands and disturbances of attention and memory. Hallucinations may occur, but frank hallucinosis is uncommon. Paranoid delusions are not infrequently seen. The presence of a pustular acneform eruption may aid in the diagnosis but is more frequently absent than present. Indeed, there seems to be no relation between the threshold for the dermatologic and neurologic manifestations of bromide toxicity. A history of ingestion of bromides is frequently very difficult to obtain, so that determination of the blood bromide concentration is the most reliable diagnostic measure.

TREATMENT OF BROMIDE INTOXICATION

Treatment consists first and foremost of abrupt cessation of bromide intake, with substitution of other sedatives only when restlessness cannot be controlled by such physical therapeutic measures as packs and tubs. Fluid intake should be kept up, parenterally if necessary. Diuretics are ineffectual in expediting excretion by the kidneys; the amount which can be eliminated by the bowels does not justify the drastic use of cathartics. The administration of sodium chloride in dosage of from 6 to 12 Gm. daily is effective in more rapidly displacing the bromide from the tissues. However, it is said by Strecker and Ebaugh [9] that the displacement may take place more rapidly than does elimination by the kidneys, with a resultant temporary rise in blood bromide concentration, and therefore these authors believe that this procedure should not be instituted too rapidly. This must be borne in mind in giving parenteral fluids. Since a liter of physiologic solution of sodium chloride contains 9 Gm. of sodium chloride, dextrose is probably preferable, while the blood bromide concentration remains very high. The fact that in the presence of a large amount of bromide in the tissues a considerable proportion of the gastric acidity is due to hydrobromic acid,[10] which normally is reabsorbed in the intestine, opens another avenue for the elimination of bromide. Toenhart [11] was successful in removing 5 Gm. of bromide by repeated aspiration of the gastric contents over a period of six days from a patient with an initial blood bromide concentration of 300 mg. per hundred cubic centimeters, with clinical recovery in this period. This is a considerable improvement over the two or three week period necessary with salt therapy only. The application of the Wangensteen technic of continuous suction probably would be still more effective. It is difficult to conceive how the removal of but 5 Gm. of bromide from a patient with a blood bromide content of 300 mg. per hundred cubic centimeters would be clinically effective. There must have been approximately 21 Gm. of bromide in the blood alone, and since the tissues contain on an average about one third the concentration of the blood, almost 200 Gm. more in the rest of the body. Then the removal of 5 Gm. of bromide represented a reduction of but 4 per cent of the total bromide content of the body. Obviously, more knowledge of the distribution and excretion of bromide is necessary for a full evaluation of this mode of treatment.

9. Strecker, E. A., and Ebaugh, F. G.: Practical Clinical Psychiatry, ed. 3, Philadelphia, P. Blakiston's Son & Co., 1931, p. 195.
10. Chatagnon, Camille: Presse méd. **45**: 659 (May 1) 1937.
11. Toenhart, O. E.: Wisconsin M. J. **34**: 901 (Dec.) 1935.

SUMMARY

Bromide therapy should not be attempted without careful control of the dosage both of bromide and of salt, so that the blood bromide concentration is not allowed to rise above the 125 to 150 mg. per hundred cubic centimeter level, which is the maximum safe therapeutic concentration. Care should be taken that the patient is not allowed to continue bromide medication without supervision. Blood bromide determinations should be carried out on all patients manifesting evidence of symptoms of the organic reaction type, such as confusion or delirium, and appropriate therapeutic measures instituted if toxic concentrations of bromide are found.

The Council reaffirmed its action of many years ago declaring "Neurosine" unacceptable for inclusion in New and Nonofficial Remedies because it is a mixture containing bromides sold under a proprietary name with unwarranted therapeutic claims.

HEMOLYTIC STREPTOCOCCUS ANTITOXIN-GLOBULIN-LEDERLE-MODIFIED NOT ACCEPTABLE FOR N. N. R.

The Lederle Laboratories, Inc., presented this product for the Council's consideration as a combination of hemolytic streptococcus antitoxins of broad valence identified as scarlet fever streptococcus antitoxin and erysipelas streptococcus antitoxin. The product was proposed for use in the treatment of severe and toxic cases of beta-hemolytic streptococcus infections, alone or as combined treatment using sulfanilamide for puerperal fever, erysipelas, septic sore throat, cellulitis and streptococcic pneumonia.

In the Council's consideration of the material presented, especially the advertising, question was raised as to the specificity of toxins of various strains of streptococci. It was pointed out that this was a controversial problem and that, while the firm had presented credible data to indicate that the preparation is apparently a combination of scarlet fever streptococcus antitoxin and erysipelas streptococcus antitoxin, it had presented no clinical evidence that hemolytic streptococcus antitoxin will be of great value in any streptococcic infection except scarlet fever.

Various passages in the advertising submitted by the firm were criticized and recommended to be deleted on account of the foregoing. It appears unnecessary to specify these passages from the advertising in this report. The following comment by a Council member sums up this consideration:

> It seems probable that when current work on the hemolytic streptococcus matures the biologic treatment of streptococcic disease will have to be considered in a somewhat new light. Meanwhile it seems unfortunate to discuss questions which are still in the experimental stage with such finality as is done in the Lederle booklet on Hemolytic Streptococcus Antitoxin.

In view of the objections raised and of the fact that Lederle Laboratories, Inc., has not presented adequate clinical evidence to substantiate its claims, the Council declared Hemolytic Streptococcus Antitoxin-Globulin-Lederle-Modified unacceptable for inclusion in New and Nonofficial Remedies.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 14, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE PHYSICIAN AND THE DRAFT

The selective service act—usually called the conscription bill—has passed the House of Representatives and the Senate and now goes to the Conference Committee for final decision on certain differences. No doubt by the end of the week this act will have been passed by both houses and will have been signed by the President. Immediately, no doubt, in the individual states some thousands of draft boards or exemption boards will be established, with each of which there will be associated a physician. Physicians are already being asked in many states to volunteer for service with these boards. It has been suggested that they will be willing to contribute their services now as so many thousands of them did in 1917-1918. At that time arrangements were made to pay on a per diem basis for the services of physicians only in counties where physicians could not be found to contribute the services. We have no record of any such counties.

The duty of the physician associated with the draft board is one of the utmost importance in relationship to securing a proper personnel for military service. On the physician rests the major part of the responsibility of deciding promptly whether claims for exemption on account of physical disability are just. Considering the fact that the physician associated with such a board is a resident in the district over which he has jurisdiction, the physician is not in an enviable position. He must hear the pleas not only of his friends and neighbors but also of his patients. To resist such importunities requires common honesty of purpose and a courage to do one's duty which is fundamental in the character of every good physician. No doubt he will be called on to detect malingering, perhaps to pass on certificates from family physicians and specialists certifying to disabilities which he will have to verify. The duties of physicians on these boards require not only honesty of purpose and courage to do right, even at the sacrifice of private practice, but also professional alertness to detect malingering and misrepresentation.

It has been rather generally understood that the physicians on the draft boards will make only a preliminary survey of the candidates who come before them. Those selected will then be sent to special examining boards, which will be later constituted by the Army Medical Department. On these physical examining boards will rest the final decision as to whether or not the young man is to go to camp. These boards will be located in centers of population, preferably near military posts or stations, and will include eleven medical officers and one dental officer. More complete information relative to the establishment, perquisites and duties of these boards will be published later.

In 1918, it will be remembered by many physicians, each draft board bore a relationship to a medical advisory board on which were placed the duties which now will be placed on the physical examining boards. It was found in 1918 that an average of 8.1 per cent of those examined were rejected for physical defects which were not picked up by the physical examiners of the local draft boards. This represented a total of 172,000 men between Feb. 10, 1916, and Oct. 31, 1918. These men were transported at government expense; in some instances they claimed aggravation of existing disabilities during travel from their homes to the military camps. The purpose of the new technic is to eliminate to a certain extent the number of men who are ordered into service and subsequently have to be rejected, and to eliminate as far as possible the responsibility of the government to individuals who will be without military value. Thus it is apparent that again a great burden and a great responsibility are to be placed on the physicians of our country.

American physicians have never failed in the past to meet such a call. The members of the Committee on Medical Preparedness, who have been authorized by

the House of Delegates to cooperate with government officials in securing physicians for required services, have promised with confidence that the medical profession is ready and willing to do its part.

BROMIDES IN MEDICINE

The use of bromides as sedatives has been known for almost a hundred years. Although the first case of intoxication was reported soon after the initiation of this therapy, many believed that the administration of bromides caused little, if any, more deleterious effects than those following the use of chlorides. More recently bromide intoxication has become so prevalent that there is no longer any question that the various bromide preparations possess distinctive effects, especially on the central nervous system. A recent report[1] published in THE JOURNAL plainly indicates the frequency with which undesirable effects result from bromide administration. Although the condition appears to be common, physicians may fail to recognize bromide intoxication. There may be, then, a much higher incidence of toxicity than is generally recorded. A frequent cause of intoxication is continued self medication by patients using prescriptions issued by physicians to alleviate the chronic suffering of the alcoholic addict or psychoneurotic individual. This should constitute an ample warning against any desire for casually prescribing a bromide preparation for headaches, insomnia, restlessness or so-called nervousness without cautioning patients about "follow-up" visits.

Pharmacologically the bromides have, among other factors, one important action: Intake of the slowly eliminated bromides results in the elimination of the more rapidly excreted chlorides from the body, which is a decisive factor in the production of intoxication. Sleep is induced by causing decreased interest and sensitivity to disturbing influences or stimuli. Since the sleep is often not deep or refreshing, the patient may awaken feeling unrefreshed and showing evidence of mental confusion which may persist for several hours after waking.

The blood bromide concentration can be simply and inexpensively determined. A bromide content of the blood even as low as 50 mg. per hundred cubic centimeters of blood may in some persons result in mild nervous manifestations. Continued use may cause a chronic manifestation of intoxication often called "bromism," a syndrome which may show cutaneous eruptions, disturbances of digestion, disturbances of sensation or mental upsets.

Because of lack of restrictions on "over the counter" sale of the bromides there has been in the past little difficulty in the public obtaining them. One precaution, due to the new Food, Drug and Cosmetic Law, provides that drug labeling must carry "adequate directions for use" and "adequate warnings." The following label has been suggested as an example, to be suitable for preparations containing bromides sold "over the counter" without a physician's prescription and which are considered to be so dangerous with careless use that they should be sold only on a doctor's prescription:

> Warning: Frequent or continued use may lead to mental derangement, skin eruptions or other serious effects.
> Do not take more than the dosage recommended.
> Not to be taken by those suffering from kidney disease.

The Washington bureau has released information explaining the attitude of the Food and Drug Administration in connection with the dosage of bromides. It is the belief of the administration that bromides may be considered dangerous drugs under section 502 (j) of the act if an equivalent to 15 grains (1 Gm.) of sodium bromide is taken in a single dose or if the total daily dosage is equivalent to 30 grains (2 Gm.) with an interval of not less than three hours between single doses. These restrictions do not, of course, apply to prescriptions issued by physicians.

Elsewhere in THE JOURNAL is a report[2] of the Council on Pharmacy and Chemistry on the hazards of bromides, particularly in proprietary medicaments. Although the mortality from bromide intoxication is relatively low, probably less than 1 per cent, recovery from symptoms of poisoning may require from one to six weeks. The bromides have played an important part in therapeutics, especially in the management of epilepsy, but because of adverse effects neurologists have often questioned whether or not the harmful effects from the bromides might overshadow their good. In the latter part of 1938 a group of manufacturers' representatives met in Washington to discuss a common attitude toward certain analgesic and sedative drugs, the bromides being included. As a result of this meeting an organization was established to investigate certain properties and to review the existing literature. The group later implied that many existing impressions were based on false interpretations and that death or intoxication resulting from the use of bromides was so rare that great difficulty was found in estimating the accuracy of the records. These representatives of a group of manufacturers had, of course, a common interest in commercial preparations which included the bromides.

In the hands of the average physician, sodium or potassium bromide is a useful remedy. Competent physicians recognize their value and the side reactions, but the public must be forewarned against self medication induced either by refilling of prescriptions without the authority of the physician or by the use of the bromide-containing mixtures on the market represented by such compounds as the well known type of acetanilid-bromide effervescing mixtures.

Bromide intoxication does vary with the individual. One person may take rather large quantities of bromide

1. Gundry, L. P.: Bromide Intoxication, J. A. M. A. **113**: 466 (Aug. 5) 1939.

2. Hazards of Bromidism in Proprietary and Uncontrolled Hypnotic Medication: Neurosine (Dios Chemical Company) Not Acceptable for N. N. R., this issue, p. 933.

over a period of time with relatively little accumulation in the blood stream while another person may take relatively small quantities over the same period with large accumulation. Continued intake of significant quantities of bromides over indefinite periods inevitably leads to accumulation of bromides in the blood stream. Individuals may therefore be afflicted with symptoms of bromide intoxication from frank bromide poisoning to the intangible symptoms of irritability, tendency to dizziness, confusedness and vagueness of thinking. Other symptoms which have been reported include inability to concentrate, loss of ambition and interest in work and surroundings, hallucinations, disorientation and suicidal or homicidal impulses. The latter symptoms are all a part of the bromide psychosis.

In this day, when the emotional strains are already impinging to an alarming extent on the consciousness of the public in general, it is high time that society protected itself against the use of those preparations which may contribute to an alarming increase in various forms of mental upsets or even insanity. There is no need for hysteria over the unwarranted use of preparations containing potentially dangerous ingredients, but there is need for restricted self medication. With the conscientious and combined efforts of physicians, pharmacists and pharmaceutic manufacturers, such an aim can easily be achieved.

Current Comment

SCIENTIFIC COLLABORATION

Up to the immediate past, as pointed out recently in a leading article [1] in *Nature,* scientific collaboration has not been confined to the so-called democracies but has embraced all civilized countries. By the intensification of totalitarian policy, international scientific cooperation has been adversely affected. Indeed on several occasions international conferences of both medical and general scientific nature have been postponed or canceled. This has had the effect of forcing men of science of free countries into closer collaboration, as exemplified by the inauguration in 1938 of the British and American Association Lecture, sponsored by the respective Associations for the Advancement of Science. The discussion also discloses the fact that recently a strong group of French scientific workers was inquiring into the possibility of publishing periodically in *Nature* articles contributed by French men of science in the French language—a suggestion which was apparently viewed favorably by the editors of that journal. The comprehensive scheme for collaboration by means of the centralization of scientific knowledge developed by a French group and established by the French government's Centre national de la recherche scientifique called a Service de documentation under the direction of Prof. Pierre Auger was also discussed. This service initiated the publication of an analytic bulletin containing titles or short abstracts of papers published in the chief journals on chemistry, physics, applied chemistry, technical physics, biochemistry and some branches of biology. Extensive use was to be made of microfilms, and bibliographies of special subjects were to be made by assembling sections of microfilm. The preliminary aspects of the service were limited to France, Great Britain and the dominions and colonies. According to *Nature,* during its brief life it received valuable aid from the Science Library in London. At the time of writing the article the plight of this service was unknown.

1. International Democratic Unity, Nature **145**: 947 (June 22) 1940.

GARBAGE DISPOSAL AND TRICHINOSIS

Trichinosis is probably a greater problem in the United States than in any other country in the world.[1] Until comparatively recently the relatively high incidence of trichinosis in various population groups of the United States was not commonly appreciated. That garbage-fed swine are especially important as sources of human trichinosis has been repeatedly emphasized.[2] Scraps of pork are commonly present in garbage and up to 5 per cent of these scraps, including trimmings and other discards from butcher shops, hotels, homes and elsewhere, have been reported to contain live trichinae. Years ago it was observed that garbage-fed hogs exhibited a high incidence of trichinae, whereas swine raised on pasture or fed on cooked meat and corn either were free from trichinae or exhibited a low incidence of trichinosis. Recent studies indicate that geographic areas in which many hogs are raised on garbage are the areas having the most clinical trichinosis.[2] Inquiries addressed to health officers in 964 cities brought out that the hog-feeding method of garbage disposal is the most common method practiced in these municipalities, although, of course, other methods of disposal, including incineration, fill and cover, and reduction, are to a lesser extent also used.[3] Large numbers of hogs fed on uncooked municipally collected garbage are marketed each year, and trichinous pork from these hogs, in cases in which the meat is packed in uninspected packing plants, may even be incorporated in products customarily eaten raw by the consumer. According to Wright the results of this survey indicate that American municipalities, either directly or indirectly, are probably the largest feeders of raw garbage to swine and, consequently, these communities would appear to be chiefly responsible for the dissemination of trichinosis. This serious indictment implies that the municipalities themselves are contributing to the ill health of their own citizens; as long as our cities and towns continue to contribute to the spread of trichinosis they will constitute a serious deterrent to the control of this disease. Since hogs fed on uncooked garbage probably represent the chief source of human trichinosis, a more rigorous control of garbage feeding should be established. This can be done through regulations which provide for the licensing and supervision of garbage feeding plants, and for the cooking of garbage for a period sufficient to destroy all trichinae.[2]

1. Hall, M. C.: Studies on Trichinosis, Pub. Health Rep. **52**: 873 (July 2) 1937.
2. Wright, W. H.: Studies on Trichinosis, Am. J. Pub. Health **29**: 119 (Feb.) 1939.
3. Wright, W. H.: Studies on Trichinosis, Pub. Health Rep. **55**: 1069 (June 14) 1940.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PROGRESS OF MEDICAL PREPAREDNESS STUDY

The Second Fifty Per Cent

On September 6 the Committee on Medical Preparedness had received 93,437 schedules from physicians throughout the United States and its outlying territories. This number represents 52 per cent of the 179,796 schedules which were mailed to physicians in July.

The response of physicians in different states showed a wide variation, from 83.2 per cent in Nebraska and 85.8 per cent in the Canal Zone to 38.5 per cent in New Mexico and 0.08 per cent in the Philippine Islands. Thirty-eight states showed more than 50 per cent of questionnaires returned.

By Corps Areas the percentage of returns was, on August 30, as follows:

First Corps Area.—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont: 13,567 schedules mailed; 6,958, or 51.3 per cent, returned.

Second Corps Area.—Delaware, New Jersey, New York: 33,355 schedules mailed; 17,653, or 52.9 per cent, returned.

Third Corps Area.—District of Columbia, Maryland, Pennsylvania, Virginia: 21,543 schedules mailed; 10,639, or 49.4 per cent, returned.

Fourth Corps Area.—Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee: 18,148 schedules mailed; 9,012, or 49.7 per cent, returned.

Fifth Corps Area.—Indiana, Kentucky, Ohio, West Virginia: 18,100 schedules mailed; 9,892, or 54.7 per cent, returned.

Sixth Corps Area.—Illinois, Michigan, Wisconsin: 22,176 schedules mailed; 11,561, or 52.1 per cent, returned.

Seventh Corps Area.—Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota: 18,341 schedules mailed; 11,846, or 64.6 per cent, returned.

Eighth Corps Area.—Arizona, Colorado, New Mexico, Oklahoma, Texas: 12,270 schedules mailed; 5,911, or 48.2 per cent, returned.

Ninth Corps Area.—Alaska, California, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming: 17,495 schedules mailed; 9,385, or 53.6 per cent, returned.

Canal Zone.—134 schedules mailed; 115, or 85.8 per cent, returned.

Hawaii.—472 schedules mailed; 194, or 41.1 per cent, returned.

Philippine Islands.—3,695 schedules mailed; 3, or 0.08 per cent, returned.

Puerto Rico.—486 schedules mailed; 264, or 54.3 per cent, returned.

Virgin Islands.—14 schedules mailed; 4, or 28.6 per cent, returned.

Now that the vacation season is nearing its close, some physicians may be expected to return the schedules which have been awaiting their return.

Changes of address should be reported promptly to the Directory Department of the American Medical Association so that the Committee on Medical Preparedness can supply schedules to physicians who could not be reached on the first mailing.

The first 50 per cent of returns represents a prompt and willing response from the physicians in all parts of the nation. It is earnestly hoped that the second 50 per cent will respond without delay.

U. S. CIVIL SERVICE COMMISSION APPEALS FOR 600 CIVILIAN MEDICAL OFFICERS

In connection with the immediate authorized expansion of the Army, there is need for 600 civilian medical officers for temporary or part-time service. The duties assigned to them will be performed later by commissioned officers of the Army Medical Corps if and when such officers are called to active duty. Appointees will not receive commissions in the Army as a result of their temporary or part-time service. The United States Civil Service Commission has prepared a questionnaire and is seeking to ascertain names of physicians in the United States available for these positions and to secure acceptances from them. Applications must be on file with the commission's Washington office not later than October 1 if received from states east of Colorado and not later than October 4 if received from Colorado and states westward. The salaries for the positions concerned will be from $3,800 to $4,600 a year, subject to a retirement reduction of 3.5 per cent. The work is largely in the field of industrial medicine. Application blanks may be secured by addressing the United States Civil Service Commission, Washington, D. C., requesting form 2398a, August 1940, covering application for Civilian Medical Officers, Temporary and Part-Time Service.

PROPOSED STUDY OF WARTIME DISEASES

The American Red Cross and Harvard University announced, August 18, the proposed establishment of a 100 bed hospital in England for the study and treatment of communicable diseases under wartime conditions, according to the New York *Times*. Announcement was also made of the formation of a new Harvard public health unit for field and laboratory work in epidemiology in Great Britain. The hospital, to be known as the American Red Cross-Harvard Hospital, will be constructed and financed by the American Red Cross. Harvard will furnish the medical staff of the hospital and assume responsibility for the scientific work. The purpose of the joint undertaking in addition to fulfilling an urgent need in England will be to acquire valuable information both relating to the control of epidemics under unusual or wartime conditions and to the organization of temporary mobile hospitals under similar conditions.

The work of the Harvard unit already has begun with the arrival in London of Drs. John E. Gordon and John R. Mote, professor of and assistant in preventive medicine and epidemiology in the medical school, respectively. The Red Cross will furnish the structure and equipment of a temporary or hut type of hospital, to be fabricated in this country, transported to England and set up there on foundations provided by the British Ministry of Health. It will also furnish the nursing and nonprofessional members of the staff and certain supplies for its operation. The Harvard unit will fur-

nish the medical staff of the hospital, Dr. Gordon to serve as its director under appointment from the Red Cross as well as director of the Harvard unit.

The Red Cross will be responsible for the general management of the hospital. Dr. Gordon and the superintendent of the hospital, to be appointed by the Red Cross in consultation with Dr. Gordon, will report to the Red Cross on matters of general management. On scientific and clinical phases of the hospital work in addition to laboratory and field work of the Harvard unit, Dr. Gordon will be responsible to and report to Harvard University.

PHILADELPHIA'S PREPAREDNESS PLANS

The *Weekly Roster and Medical Digest*, official bulletin of the Philadelphia County Medical Society, has established a medical preparedness section for the information of its members on military matters. The society's committee on medical economics is at work on measures to safeguard the practice of physicians called to military service and to pay them part of the fees collected from their practice during their absence. The committee is also trying to arrange some method whereby physicians on their return from service will be restored to whatever teaching, hospital, governmental and industrial positions they held when called away.

A questionnaire similar to that distributed by the American Medical Association has been prepared by the society in order that the society may have in its own files information it may be called on to give to military authorities. The questionnaire is being mailed to nonmembers as well as members of the society.

The county society has also offered its services to the state director of selective service in the selection of medical members of local draft boards under the selective service law.

The subjects of coming lectures in the course on medical preparedness which the society is presenting, in addition to those previously announced will be:

October 3, Concentrations of Civilian Personnel for Military Service—Epidemiological Aspects, Contagious and Venereal Disease Problems.

October 10, Expected Psychiatric Problems in a Mobilization.

October 17, Tissue Reaction to Missiles of War—Ballistics, The Surgery of War as Contrasted with Industrial Surgery.

Dr. James B. Mason, co-chairman of the National Defense Committee and chairman of the speakers' bureau, made a radio talk, September 2, on "The Philadelphia Doctor and Medical Preparedness."

MEDICAL PILOTS

Medical Pilots, a group in which membership is available to all white male American citizens who are licensed practitioners of medicine and members of their local medical society, was organized in southern California in June. Officers include Drs. Phillip Ross Sutherland, Los Angeles, president; Bartlett C. Shackford, Long Beach, vice president, and Colby Hall, Los Angeles, secretary. An active member in the group must have an active private pilot's rating or a higher rating. Associate members must have a solo rating. At a meeting in the Hollywood Athletic Club, Hollywood, September 5, Ensign Moulton Taylor discussed aviation radio and flying instruments in general.

Organization Section

WHAT SHALL WE TEACH?

Fourth annual symposium sponsored by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association in cooperation with the A. M. A. Sections on Ophthalmology, Pediatrics, Laryngology, Otology and Rhinology, and Preventive and Industrial Medicine and Public Health, Tuesday, June 11, 1940, Hotel Roosevelt, New York.

I. H. GOLDBERGER, M.D., Assistant Director of Health Education, Board of Education, New York City, Presiding

DR. GOLDBERGER: The presence here today of about seven hundred teachers is due to the action of the Board of Superintendents, who granted these health specialists a half-day holiday for the purpose of participating in the proceedings of this symposium. It is hoped that the papers which we shall hear this afternoon and the discussion that will follow will help to contribute to the study, planning and improvement of school health programs and thus pave the way to progress in improving the health of children and of the communities in which they live.

I. THE BUREAU OF THE CENSUS REVEALS HEALTH PROBLEMS

HALBERT L. DUNN, M.D.
Chief, Division of Vital Statistics, Bureau of the Census, U. S. Department of Commerce
WASHINGTON, D. C.

Recently the Bureau of the Census has begun to modernize its educational approaches to the public. A portion of its data deals with the facts of birth, death and population. To a lesser extent fertility data, marriage and divorce statistics, facts about criminals, judicial decisions, insanity and hospitals are also of interest to health departments. Yet these data have remained essentially unused by the majority of American people. Four years ago the Division of Vital Statistics of the Bureau of the Census began the serious study of adapting the materials under its jurisdiction to the needs of public health. In some instances we have played an active role in attempting to understand the other person's point of view rather than passively waiting for him to ask questions. In the campaigns for more complete birth registration we have studied the interests of entire communities. We have become acquainted whenever possible with the leaders of community organizations. We have then remodeled stereotyped talks on birth registration and recast them in the language of the persons who are members of organizations representing vital forces in local communities.

Thus two steps are being taken by the division in adapting material under its jurisdiction to the needs of public health: the adoption of a philosophy of service and the study of the interests of others.

A third step, of great value, is publication in "small packages." The ordinary person finds statistics peculiarly difficult to assimilate in anything but small packages. This consideration gave birth four and a half years ago to the "Vital Statistics—Special Report Series."

Many special projects are planned which will supplement public health needs, including:

1. Restoration of marriage and divorce statistics.
2. Extension of knowledge on mental and feebleminded institutionalized patients.
3. Collection of facts concerning hospitals and other institutions where people die.
4. Computation of three year death rates.
5. Calculation of time trends for principal causes of deaths.
6. Special data and studies on fatal accidents.
7. A nationwide county by county test of the completeness of birth registration.

Mimeographed copies of complete papers and discussion will be sent gratis by the Bureau of Health Education to persons professionally interested in health education.

8. Studies on birth rates and infant mortality in terms of the social economic factors.

9. Special monographic studies on certain causes of death.

Four page county summaries will consolidate all important facts and there will be approximately 3,000 such releases.

II. THE COLLEGE HEALTH SURVEY REVEALS CERTAIN NEEDS OF THE LOWER SCHOOLS

RUTH E. BOYNTON, M.D.
Director, Students' Health Service, University of Minnesota
MINNEAPOLIS

The effectiveness of a health education program is usually measured by either an increase in health knowledge or an improvement in health habits of individuals exposed to health education. It is extremely important for all in health work to work together on a program which will have continuity and progression.

The evaluation of health knowledge of college students may be done in two ways: (1) by attempting to discover by the use of so-called health knowledge tests how well informed they are in health matters and what attitudes toward health they have developed, and (2) by determining from physical examination and health history the health status of the individual.

Of the 4,545 new students at the University of Minnesota examined in the fall of 1938-1939, according to their health histories 98 per cent were thought to have an adequate diet and good eating habits. Ninety-three per cent obtained from seven and one-half to eight hours of sleep. Approximately 77 per cent of the men and 58 per cent of the women engaged in no extracurricular activities. About 15 per cent took no form of physical exercise. About 40 per cent had been immunized against diphtheria; 85 per cent had been successfully vaccinated against smallpox. Twenty-five per cent of the women and 9 per cent of the men were 10 per cent or more underweight; 17 per cent had an A posture and 21 per cent had a posture designated as C or worse. Sixty-seven per cent had moderate or excessive dental caries; 76 per cent had normal vision.

Results of health knowledge tests given university students are indications of the need for improved health teaching in the lower schools. They reflect the need for an extension and improvement in health teaching in all the schools.

Correct health knowledge is a first step toward better health practices. The desire to practice better health habits is the ingredient needed. Health instructors must find some way to develop an interest in better health habits.

Studies showing the lack of health knowledge of students should stimulate expansion in our health program and give encouragement to the providing of a continuous, well organized and progressive curriculum in health from kindergarten through college.

III. RELATIONSHIPS BETWEEN HEALTH EXAMINATION AND HEALTH EDUCATION

CHARLES C. WILSON, M.D.
Director of Physical and Health Education, Board of Education
HARTFORD, CONN.

Health education is not medical education; it is education which the layman needs to promote his own health and to cooperate in maintaining and promoting the health of his community. The health examination is one means of determining individual health needs or health problems. The recognition of unmet health needs should be followed by a planned program of education and guidance, initiated by the school medical adviser and continued by the teacher and school nurse. Acquaint the pupil and his parents with the significance of conditions found and the advantage of treatment. Personal health problems can be helped by educational efforts of teachers and nurses. These educational efforts relating to health needs, as revealed by health examinations, should aim to teach (1) the importance of preventive measures and of securing attention for remediable defects and abnormalities, (2) the dangers and limitations of self diagnosis and self treatment, (3) where treatment is to be secured and (4) the necessity of each individual's assuming some responsibility for his own health care.

Health education should be related to life rather than be a learning of abstract words and ideas. Individual health guidance and group health instruction can be based, in part, on the problems revealed by health examinations.

Suitable facilities are a prerequisite for examinations which will have desirable educational results. Schools must provide attractive health guidance rooms permitting privacy during examinations and conferences. The health examination should be a pleasant experience and its educational outcome requires that a study be made of school health procedures. There should be opportunity for the physician to explain his observations and recommendations. With histories, with facilities for privacy and with adequate time the physician can conduct health education conferences rather than hurried, superficial inspections.

IV. THE INTERESTS OF CHILDREN VERSUS DICTA OF EXPERTS AS BASES FOR HEALTH INSTRUCTION

DOROTHY B. NYSWANDER, PH.D.
Director, School Health Study Committee
ASTORIA, N. Y.

Experts in the field of public health, private practice and education have succeeded in changing old attitudes toward health and in creating new attitudes as to how people should think and behave when confronted by health problems.

The health educator in the schools has recourse only to the experts who have said that certain facts were important and that undoubtedly teaching them must bring values in their wake. Thus the health educator leaves himself wide open to criticisms by educational psychologists who have for years been exploring not only what children need to learn in arithmetic, spelling and reading but how children learn these subjects. The teaching of health has been a stepchild of the classroom teacher. Without the results of research to guide her comparable to that for the three R's, she has had little help on what to teach or how to teach the facts, attitudes and habits involved in healthful living.

The beginning and end of the learning process is the child himself. Experts often fail to recognize this. Too often the expert thinks of what he wants to accomplish and forgets that it is the child who has to reach goals of his own choosing. Health educators must integrate the information needs and dynamic interests of the child through worth while life experiences.

Our courses of study in school health resemble too much the emphases which we are using in adult health education programs. They have been built around health or disease entities rather than around children's interests. Certain subjects may be of interest to the experts but do they have meaning or interest to children? For young children health is a series of specific knowledge and attitudes but these should be taught in connection with real projects of living and planning and thinking so that generalizations will emerge from these specific learning activities at a later period.

The sounder education becomes in its principles of teaching, the less costly may be the education of the adults in the community. And it is to the furthering of research in methods and technics of education in the schools that we now need to turn.

DISCUSSION

DR. RUTH M. BAKWIN, New York: Health examinations cannot be done *en masse*. The number of children per hour which most school physicians are expected to examine leaves the results meaningless. A health examination is the most difficult type of examination and the medical profession is not yet prepared to make a good health examination. Emphasis in the school should be on health education instead of on exam-

ination. Education is the instrument of a democracy, and with information available in this field better national health may be expected.

IRA V. HISCOCK, Sc.D., New Haven, Conn.: After decisions have been reached as to What to Teach and How to Teach, we need to consider how the process is to become dynamic and vital in a given community. The task may be embraced by giving emphasis to complexity, critical evaluation, clarity, content, concentration, curriculum, continuity, calendar, coordination, cooperation and cost.

REV. WILLIAM R. KELLY, New York: Inconsistency between knowledge and practice may be called the moral problem of health education. Our aim should be for a greater measure of consistency between health knowledge and practice on the part of pupils, teachers and all concerned with the health program.

DR. HARRY E. KLEINSCHMIDT, New York: We who undertake to teach must determine skilfully and precisely what should be taught and what may well be left out of the curriculum. What is the good of expert teaching technic if what we teach is pointless, unsound or incomplete? The most important thing to teach is that intangible something we call attitude. It is the scientific approach we are trying to cultivate. Out of a mass of technical knowledge we must select those particular elements which, if learned and assimilated, will lessen the drag of sickness and make life sweeter.

DR. GEORGE M. LYON, Huntington, W. Va.: Our health education plans must be simplified as much as possible. Controversial issues must be presented in a sensible manner and all the practices and teachings must be consistent with recognized possibilities and limitations; otherwise the school health education programs cannot be educationally sound or socially desirable.

DR. DEAN F. SMILEY, Ithaca, N. Y.: It is important that we give each child a systematic logical knowledge of his body so that when unexpected health problems arise in his after-school years he will have a sufficient number of scientific facts and principles in the back of his mind to make his problem solving easier and more nearly correct. I would argue, therefore, for both a student interest approach and a logical or systematic approach in health education.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 10132, the Wadsworth conscription bill, has passed the House. Section 3 of the bill provides, in part, that in case of any person who during the year 1940 entered on attendance for the academic year 1940-1941 (1) at any college or university which grants a degree in arts or science, to pursue a course of instruction satisfactory completion of which is prescribed by such college or university as a prerequisite to either class of such degrees or (2) at any university described in 1 to pursue a course of instruction to the pursuit of which a degree in arts or science is prescribed by such university as a prerequisite, if, during his attendance at such college or university while pursuing such course of instruction, such person is selected for service and training prior to the end of such academic year, or prior to July 1, 1941, whichever occurs first, his induction into the land or naval forces shall, on his request, be deferred until the end of such academic year, but in no event later than July 1, 1941. During a discussion of this particular section on the floor of the House the question was raised as to whether or not the exemption in favor of students applied to those in attendance at medical schools. Representative May, Kentucky, who was in charge of the bill, answered the question in the affirmative.

Bill Introduced.—H. R. 10484, introduced by Representative McCormack, Massachusetts, provides that no individual who is licensed to practice medicine under the laws of any state, territory or the District of Columbia shall be ineligible for appointment, or for examination, as a medical officer in the active or reserve components of the military or naval forces of the United States solely by reason of any rating or classification of the medical school from which such individual was graduated.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Appointments to State Health Board.—Drs. Amos Christie and Charles E. Smith, San Francisco, have been appointed members of the state board of health. They succeed Drs. Howard Morrow and William R. P. Clark, both of San Francisco, who resigned when the headquarters of the board were moved from San Francisco to Los Angeles, it was reported.

Society News.—Dr. Arthur Carol McKenney Jr. discussed "Medical Aspects of Fundus Examination" before the San Francisco County Medical Society, September 10, and Drs. Samuel D. Aiken and George S. Campion gave a description of fundi with colored photographs. All are of San Francisco. ——The Los Angeles County Medical Association will devote a general meeting, September 19, to a discussion on "The Medical and Religious Rights of the American Citizen Under Increasing Government Control." The speakers will include representatives of medicine and of different religious faiths.

DISTRICT OF COLUMBIA

Annual Scientific Assembly.—The Medical Society of the District of Columbia will hold its annual scientific assembly, October 15-17. The theme this year will be cardiovascular-renal disease.

The Kober Lecture.—John R. Mohler, D.V.M., chief of the bureau of animal industry, U. S. Department of Agriculture, Washington, has been chosen Kober lecturer for 1941 under the rules governing an endowment fund established by the late Dr. George M. Kober. Dr. Mohler will deliver the lecture, March 28, on "Undulant Fever," under the auspices of Georgetown University. Dr. Kober stipulated, among other things, that a lecturer, to whom an award would be given, was to be chosen every third year by an executive board representing the Washington Academy of Sciences, the National Tuberculosis Association, the Anthropological Society of Washington and the Medical Society of the District of Columbia. Dr. Mohler received his degree of doctor of veterinary medicine from the University of Pennsylvania in 1896. He has been awarded many honorary degrees, is a member of several scientific societies and was president of the American Veterinary Medical Association in 1913.

ILLINOIS

District Meeting.—The fall meeting of the Iowa and Illinois Central District Medical Association will be held at the Le Claire Hotel in Moline, September 18. The speakers will be Drs. Earl B. Ritchie, Davenport, Iowa, who will present "A Short Résumé on Industrial Dermatoses," and Percy S. Pelouze, Philadelphia, "Gonococcal Infections and Sulfonamide Compounds."

Personal.—Dr. Seymour Fisher, recently medical director of the Soldiers' and Sailors' Children's School Hospital, Normal, has been appointed superintendent of the division for handicapped children in the Illinois State Department of Public Welfare, Springfield. He succeeds Dr. Paul H. Harmon, now of Sayre, Pa., who resigned late in 1939. Dr. Sol Paul Ditkowsky, Chicago, was appointed pediatrician at the Normal institution to succeed Dr. Fisher.

Schools Closed—Poliomyelitis Suspected.—The elementary and high schools of the city of Virginia in Cass County have been closed for two weeks because five children in the community were ill with what was thought to be poliomyelitis, according to the Chicago *Tribune*, September 10. The report stated that the illness in three of the five children had been definitely diagnosed as infantile paralysis and that the other two were suspected cases.

INDIANA

Memorial Tablet to Pioneer Physicians.—A bronze tablet erected to the memory of pioneer physicians of Clay County was dedicated, July 28, with John G. Benson, D.D., Indianapolis, as the principal speaker. The tablet has been placed in the Clay County hospital, Brazil, by the county medical society.

Retiring Dean Honored.—The Monroe County Medical Society held a dinner meeting in honor of Dr. Burton D. Myers, July 10, to mark his retirement as dean of the Indiana University School of Medicine at Bloomington. Dr. Myers had been dean of the Bloomington school since 1927. He joined the faculty in 1903 as professor of anatomy, becoming assistant dean in 1920. He retired, July 1, having reached the university's retirement age of 70 years. At the dinner Dr. Myers was presented with a life membership in the Monroe County Medical Society and speakers included Dr. Karl R. Ruddell, Indianapolis, president, state medical association; Herman B. Wells, LL.D., president of Indiana University; William Lowe Bryan, L.H.D., president emeritus of Indiana University; Attorney George Henley and Mr. Thomas A. Hendricks, executive secretary of the state medical association.

Short Courses in Tuberculosis.—The Indiana Tuberculosis Association is offering short courses in tuberculosis to practicing physicians. An afternoon and evening will be devoted to each course, which covers recent progress in treatment. The following sanatoriums have been selected as teaching centers:

Indiana State Sanatorium, Rockville, September 24.
Boehne Tuberculosis Hospital, Evansville, October 8.
James O. Parramore Hospital, Crown Point, October 10.
Smith-Esteb Memorial Hospital, Richmond, October 10.
Irene Byron Sanatorium, Fort Wayne, October 15.
Sunnyside Sanatorium, Indianapolis, October 16.
Healthwin Hospital, South Bend, October 22.
Hillcrest Tuberculosis Hospital, Vincennes, October 22.
"Silvercrest" Southern Indiana Tuberculosis Hospital, New Albany, October 23.
William Ross Sanatorium, LaFayette, November 12.

Further information may be obtained from the association at 1219 Security Trust Building, Indianapolis.

KANSAS

Changes in State Health Staff.—Dr. Richard F. Boyd, assistant director of child hygiene, state department of health, Topeka, has been appointed director of local health, a position left vacant since the death of Dr. Rolla B. Stafford. Dr. Paul R. Ensign, Sparta, Ga., has resigned as director of the child health demonstration in Hancock County to become assistant director of child hygiene succeeding Dr. Boyd.

Annual Registration Due Between July 1 and October 1.—Physicians licensed to practice medicine in Kansas are required to renew their licenses annually between July 1 and October 1 and to pay a fee of $1 to the secretary of the board of medical registration and examination. The secretary must strike from the register of licensed physicians the names of all physicians who fail to pay their annual registration fees as required by law. Physicians whose names are so removed may be reinstated by paying the secretary $5 and submitting to him satisfactory proof of moral fitness.

KENTUCKY

Institute on Psychiatry.—The second regional postgraduate institute of the American Psychiatric Association will be held at the Central State Hospital, Lakeland, September 23 to October 5, in cooperation with the division of hospitals and mental hygiene. The lecturers will include Drs. Oskar Diethelm and Severo E. Barrera, New York; Edward G. Billings and Franklin G. Ebaugh, Denver; Maurice Levine, Cincinnati; S. Spafford Ackerly, Louisville; Joseph G. Wilson and John D. Reichard, Lexington; Lawrence Kolb, U. S. Public Health Service, Washington, D. C., and Lieuen M. Rogers, U. S. Public Health Service, Springfield, Mo. Dr. Ebaugh is chairman of the committee on psychiatry in medical education of the American Psychiatric Association, which is sponsoring the series of institutes. The first was held at the Agnews State Hospital, Agnew, Calif., in June.

Society News.—The Christian County Medical Society honored Dr. Austin Bell, Hopkinsville, who is president-elect of the Kentucky State Medical Association, at a meeting in Hopkinsville, July 16, attended by 200 physicians from western Kentucky. Speakers were Drs. Arthur T. McCormack, Louisville, secretary of the state association, and John H. Blackburn, Bowling Green.——Drs. Philip F. Barbour and John Keller Mack, Louisville, addressed the Graves County Medical Society, Mayfield, July 17, on diarrhea and tuberculosis, respectively.——At a meeting of the Nelson County Medical Society in Bardstown, August 8, the speakers were Drs. James Murray Kinsman, on "New Treatments of Pneumonia"; Maurice G. Buckles, "Bronchoscopy in Diagnosis and Treatment of Chest Diseases," and Harry S. Andrews, "Treatment of Diarrhea in Children." All are of Louisville.

LOUISIANA

Tri-State Medical Meeting.—The thirty-fifth annual meeting of the Tri-State Medical Society will be held at the Washington-Youree Hotel, Shreveport, September 25-26, with the Shreveport Medical Society acting as host. The speakers will include:

Dr. Horace W. Boggs, Shreveport, Sulfathiazole—Clinical Application and Toxicity.
Dr. Roy R. Kracke, Emory University, Ga., Toxic Effects of Drugs on the Blood.
Dr. Robert K. Womack, Longview, Texas, Dysuria in the Female.
Dr. Louis F. Knoepp, Shreveport, Problems Concerning Some of the Indications for Chest Surgery.
Dr. Ralph H. Riggs, Shreveport, Bronchoscopy in Pulmonary Disease.
Drs. James K. Howles and Charles B. Kennedy, New Orleans, Diagnosis and Treatment of the Common Skin Diseases.
Dr. George W. Parson, Texarkana, Ark., Interesting Cases of Tularemia.
Dr. Arthur Neal Owens, New Orleans, A Consideration of the Treatment of Burns.
Dr. Robert W. Cooper, Shreveport, Use of X-Ray Therapy in the Treatment of Gas Bacillus Infection.
Dr. Silas C. Fulmer, Little Rock, Ark., Diagnosis of Heart Disease.
Dr. Joseph B. Wharton Jr., El Dorado, Ark., Pontocaine in Spinal Anesthesia.
Dr. Marvin T. Green, Ruston, Nonmalignant Conditions of the Breast.
Dr. Charles S. Sentell, Minden, Management of Acute Abdominal Emergencies.
Dr. Homer E. Prince, Houston, Texas, Asthma—Practical Considerations.
Dr. John A. Hendrick Jr., Shreveport, Present Status of Transurethral Prostatic Resection.

Dr. William H. Browning, Shreveport, will deliver his presidential address Thursday afternoon. The Tri-State Society is composed of physicians of Texas, Arkansas and Louisiana.

MISSISSIPPI

New Health Units.—A health unit has been established in Tishomingo County with Dr. William R. Armstrong in charge and headquarters in Iuka. A district health unit comprising Jasper and Smith counties has been organized with offices at Raleigh and Bay Springs. The department is under the direction of Dr. William F. Bell, Bay Springs. Dr. Sidney J. Williams, Livingston, health officer of Sumter County in Alabama, has been appointed director of the Commonwealth Fund health unit in Pike County, effective August 1.

MISSOURI

Annual Clinical Conference.—The Kansas City Southwest Clinical Society will hold its eighteenth annual clinical conference, September 30 to October 3, in the Little Theatre of the Municipal Auditorium, Kansas City. Guest speakers will include:

Dr. Harvey B. Stone, Baltimore, Intestinal Obstruction.
Dr. Ira R. Sisk, Madison, Wis., Chronic Prostatitis.
Dr. John T. King, Baltimore, Relation Between Coronary Disease and Hypertension.
Dr. Roscoe R. Graham, Toronto, Principle of Decompression and Defunctioning in Diseases of the Colon.
Dr. Fred M. Drennan, Chicago, Diagnosis and Interpretation of Clinical Findings in Peptic Ulcer.
Dr. Quitman U. Newell, St. Louis, Radiation Therapy in Gynecology.
Dr. Thomas Fitz-Hugh Jr., Philadelphia, Interrelationship of Cholelithiasis and Coronary Artery Disease.
Dr. Elliott C. Cutler, Boston, Management of Cerebral Trauma.
Dr. Leo H. Garland, San Francisco, Diagnosis and Treatment of Bronchogenic Carcinoma.
Dr. John Alexander, Ann Arbor, Mich., An Evaluation of Thoracoplasty and Extrapleural Pneumothorax in the Management of Cavernous Pulmonary Tuberculosis.
Dr. Willis C. Campbell, Memphis, Tenn., Ununited Fractures of the Neck of the Femur.
Dr. James S. McLester, Birmingham, Ala., The Part Played by the Vitamins in Human Metabolism.
Dr. James G. Carr, Chicago, Prognosis in Cardiac Disease.
Dr. Jesse Bedford Shelmire, Dallas, Texas, Rules to Follow in the Treatment of Urticaria.
Dr. Luther Emmett Holt Jr., Baltimore, Newer Points of View in the Pathogenesis and Treatment of Infantile Eczema.
Dr. Arthur M. Alden, St. Louis, Neck Infections of Dental Origin.
Dr. Charles A. Bahn, New Orleans, Nutritional Eye Diseases.
Dr. Clifford J. Barborka, Chicago, Management and Treatment of Obesity.

A panel discussion on the anemias will be held in the ballroom of the Hotel President Monday evening and one on the heart Tuesday evening.

NEBRASKA

Personal.—Dr. Leland C. Albertson, formerly assistant superintendent of the Hospital for the Tuberculous, Kearney, has been appointed medical director following the resignation of Dr. Lawrence T. Sidwell.——Dr. Frederick R. Whittlesey, associate professor of medicine at the University of West Virginia School of Medicine, Morgantown, has been appointed director of the dispensary and coordinator of clinics at the University of Nebraska College of Medicine, Omaha.

Annual Registration Due On or Before October 1.—Physicians licensed to practice medicine in Nebraska are required by law to register with the Department of Public Welfare annually on or before October 1 and to pay a fee of $1. A license expires if the licentiate fails to register, but within the thirty days next following its expiration it may be revived by the payment of the registration fee and a penalty of $1. If that is not done, an order of revocation is issued and thereafter the revoked license can be reinstated only on the recommendation of the board of examiners in medicine and on the payment of the renewal fees and penalty then due.

NEW HAMPSHIRE

Pediatric Meeting.—The New Hampshire Pediatric Society held its summer meeting in Manchester, August 30. Drs. John F. McCreary, Boston, and Simon Stone, Manchester, discussed uses of vitamin A and therapy of muscular dystrophy with vitamin E, respectively. Drs. MacLean J. Gill and Ursula G. Sanders, Concord, were elected president and secretary, respectively.

NEW YORK

Septic Sore Throat Traced to Raw Milk.—An explosive outbreak of septic sore throat in the village of Waddington, St. Lawrence County, in July was traced to raw milk from one dairy, *Health News* reports. Thirty-five persons were affected. The milker at the dairy gave a history of tonsillitis shortly before the outbreak. Two cases of mastitis were found in the cows, though the disease did not appear to be caused by the streptococci which belong to the group commonly encountered in human infections.

New Regional Society.—The Western New York Surgical Association was organized at a meeting at the Niagara Falls Country Club, August 8. Officers elected included Drs. Henry N. Kenwell, Buffalo, president; Donald P. Ross, Niagara Falls, and Harold A. Blaisdell, Jamestown, vice presidents, and John A. Post, Buffalo, secretary. The association stated its purpose to be "the cultivation, promotion and diffusion of knowledge of the art and science of surgery in its various departments, to sponsor and maintain the highest standard of practice in Western New York, to hold professional and social meetings and to publish transactions."

New York City

Hospital News.—A new dispensary unit of the department of hospitals was dedicated on Welfare Island recently. It will be associated with City, Manhattan and Welfare hospitals, located on the island, and will replace two old dispensaries. ——Dr. Robert K. Lambert has been appointed attending surgeon in charge of the ophthalmologic service of Montefiore Hospital for Chronic Diseases.

Award to Dr. Goldwater.—Dr. Sigismund S. Goldwater, commissioner of hospitals of New York, has been selected to receive the 1940 Award of Merit of the American Hospital Association at its annual meeting in Boston, September 16-20. Dr. Goldwater has been a leader in the hospital field for many years. He graduated from University and Bellevue Hospital Medical College in 1901 and was superintendent of Mount Sinai Hospital from 1903 to 1916 and director from 1917 to 1929. From 1914 to 1916 he was health commissioner of New York. Dr. Goldwater was president of the American Hospital Association in 1908 and of the American Conference on Hospital Service from 1924 to 1926. Recently he was elected president of the Associated Hospital Service of Greater New York.

Lillian Wald Dies.—Miss Lillian D. Wald, founder of the Henry Street Settlement and of the first nonsectarian public health nursing system in the world, died September 1 at her home in Westport, Conn., aged 73. She resigned in 1933 as head of the famous settlement which she established in a tenement room in 1893; in 1937 she gave up the presidency of the board of directors. Miss Wald was active in the fight against child labor and in campaigns for better housing, children's playgrounds, school nursing programs and numerous other welfare projects. She was awarded the gold medal of the National Institute of Social Sciences, the Rotary Club's medal and the Better Times medal for distinguished social service. She wrote "The House on Henry Street," published in 1915, and "Windows on Henry Street" in 1934. On her seventieth birthday, March 10, 1937, at a public gathering in New York she received a distinguished service certificate of the city of New York from Mayor LaGuardia and was congratulated by President Roosevelt, Governor Lehman and others.

NORTH CAROLINA

Head of Anatomy Department Appointed.—Wesley C. George, Ph.D., professor of histology and embryology at the University of North Carolina School of Medicine, Chapel Hill, has been appointed head of the department of anatomy at the school. He succeeds the late Dr. Charles S. Mangum. Dr. George graduated from the university in 1911 and after several years of teaching took his doctorate in 1917. After service during the World War he taught at the University of Georgia and the University of Tennessee before returning to North Carolina in 1920 as associate professor of histology and embryology. He became a full professor in 1924.

Society News.—Elmer V. McCollum, Ph.D., Baltimore, addressed the Buncombe County Medical Society, Asheville, September 3, on "Contributions of Medical Science to Medicine."——At a meeting of the Mecklenburg County Medical Society, Charlotte, September 3, the speakers were Drs. Thomas D. Sparrow, on "Rationale of the Treatment of Goiter"; Otho B. Ross, "X-Ray Treatment of the Thyroid," and William Marvin Scruggs, "Total Obliteration of the Thyroid in Heart Disease."——Dr. Angus M. McBryde, Durham, addressed a joint meeting of the Alamance-Caswell Counties medical and dental societies in Burlington, August 13, on "Problems in Pediatrics."

OHIO

District Meeting.—The annual meeting of the Fifth Councilor District of the Ohio State Medical Association was held in Ashtabula, September 11. Dr. John E. Rauschkolb discussed "Ohio Medical Service Plans and Enabling Act," and speakers on the scientific program were Drs. Glen Keith Folger on "Treatment of Dysmenorrhea"; William C. McCally, "Surgical Drainage"; Curtis F. Garvin, "Chemotherapy of Streptococcic Infections"; Harold Feil, "Treatment of the Acute Heart Attack," and Robert F. Parker, "Modern Treatment of Pneumonia." All are from Cleveland.

Activities of State Medical Board.—The State Medical Board of Ohio reports the following recent results of prosecution for violations of the medical practice act, among others:

M. N. Ellis, Columbus, an unlicensed naprapath, was found guilty of "advertising and announcing" and fined $150 and costs.

C. J. Wohlgemuth, Columbus, an unlicensed naprapath, pleaded guilty and was fined $150.

Isadore Silverman, unlicensed practitioner of Cuyahoga County, fined $25 and costs.

Frank A. Miller, Medina, fined $25 and costs.

Spafford Williams, Cleveland, fined $50 and costs.

Olive Martin, Columbus, unlicensed chiropractor, placed on probation.

C. M. Leo, Columbus, unlicensed practitioner, fined $100 and costs.

A. J. Mintz, Dayton, illegal practitioner, fined $50 and costs.

S. M. Langstaff, unlicensed chiropractor of Madison County, fined $100 and costs.

H. R. Reaver, Cincinnati, unlicensed chiropractor, fined $50 and costs.

W. C. DeBenis, Cincinnati, unlicensed chiropractor, fined $50 and costs.

James R. Monroe, Toledo, unlicensed osteopath, sentenced to one year in the workhouse. This sentence was suspended on condition that Monroe leave the state.

PENNSYLVANIA

District Meeting.—The annual meeting of the Second Councilor District of the Medical Society of the State of Pennsylvania was held in Quakertown, September 12, with the following speakers: Drs. Clay Ray Murray, New York, on "Diagnosis and Treatment of Fractures of the Wrist and Elbow"; Francis F. Borzell, Philadelphia, president-elect of the state society, "Is Professional Independence Essential to National Health?"; Charles-Francis Long, Philadelphia, chairman of the state society committee on industrial health, "The Present Status of Industrial Medicine in Pennsylvania" and Chauncey L. Palmer, Pittsburgh, chairman of the committee on public health legislation, "New Health Legislation and the Practicing Physician." Fifty year testimonials were presented to Drs. Martin J. Backenstoe, Emmaus; Clarence S. Kurtz, Malvern; George F. Potteiger, Hamburg, and James T. Taylor, Pomeroy.

Pittsburgh

Incidence of Cancer in Allegheny County.—The U. S. Public Health Service recently issued results of a study of cancer in Pittsburgh and Allegheny County, the third area to be studied in a sampling survey of the incidence of the disease in the United States. A total of 6,103 patients with cancer were reported as under medical care during the year 1937. More than 50 per cent of the cases were reported by only 0.3 per cent of the physicians and 16 per cent of the hospitals. About half the physicians and hospitals saw no cases of cancer during the year. Eighteen per cent of all the cases reported were in persons under 45 years of age.

Grant for Biochemistry.—The John and Mary R. Markle Foundation has made a grant of $3,000 to the University of Pittsburgh in support of an investigation of the biochemistry of bone marrow with special reference to the development of red blood cells. Richard H. McCoy, Ph.D., recently a member of the staff of the Wistar Institute of Anatomy, Philadelphia, has been appointed research fellow to work on the project in association with Max O. Schultze, Ph.D., research fellow in chemistry on a Buhl Foundation grant. The work, which will be carried on under the direction of Charles G. King, Ph.D., professor of chemistry, represents an outgrowth of earlier studies on the biochemistry of copper.

TEXAS

Memorial to Dr. Rawlings.—A new $20,000 health center building was presented to the city of El Paso, August 11, by Mr. and Mrs. Charles Stewart Mott, Flint, Mich., as a memorial to Mrs. Mott's father, the late Dr. Junius A. Rawlings, who practiced in El Paso for many years. Dr. Thomas J. McCamant, former health officer of El Paso, paid tribute to Dr. Rawlings; Mrs. Mott made the formal presentation and Mayor Anderson accepted the keys to the building. Other speakers were Drs. Lyman T. Cox, city and county health officer; Simeon H. Newman, president of the board of health, and Miss Refugio Carreon, public health nurse. Dr. Rawlings died in 1936.

Society News.—The Texas Hospital Association has changed the place of its annual meeting for 1941 from the Hotel Galvez, Galveston, to the Hotel Adolphus, Dallas. The meeting will be held from February 27 to March 1.——At a meeting of the Big Bend Medical Society in María, August 13, the speakers included Drs. Preston Hunt, Texarkana, president of the Texas State Medical Association, on "The Relation of the Medical Profession to the Present Political Set-Up"; Leopold H. Reeves, Fort Worth, "The Romance of Southern Medicine," and Neil D. Buie, Marlin, president-elect of the state association, "The American Medical Association Platform."——Dr. Harris Hosen, Port Arthur, addressed the Jefferson County Medical Society, Port Arthur, August 12, on "Therapy in Respiratory Allergy."——Dr. Curtice Rosser, Dallas, addressed the Lamar County Medical Society, Paris, July 11, on "Management of Common Rectal Diseases."

WISCONSIN

New Milwaukee Health Officials.—Dr. Edward R. Krumbiegel, director of the bureaus of contagious diseases and school hygiene in the Milwaukee department of health since 1936, has been appointed health commissioner to succeed Dr. John P. Koehler, who resigned to seek the Republican nomination for United States Senator. Dr. Krumbiegel graduated from Marquette University School of Medicine in 1935. Dr. Errol V. Brumbaugh, deputy health commissioner for many years, retired to private life, August 15. Dr. Gerald F. Burgardt, Milwaukee, succeeded Dr. Brumbaugh.

District Meetings.—Speakers at a recent meeting of the Sixth Councilor District of the State Medical Society of Wisconsin in Fond du Lac were Dr. James Howard Johnson, Milwaukee, on "Fractures of the Hand" and the following from Chicago: Drs. Herbert E. Schmitz on "Carcinoma of the Cervix"; George O'Brien, "Coronary Heart Disease"; Jacob P. Greenhill, "Endocrinology in Obstetrics and Gynecology," and Charles Marshall Davison, "Acute Disease of the Abdomen."——At a meeting of the Ninth Councilor District in Marshfield, July 11, the guest speakers were Drs. Walter C. Alvarez, Rochester, Minn., and Walter M. Kearns, Milwaukee, on problems in gastro-enterology and urology, respectively.——Speakers before the Fifth Councilor District in Manitowoc recently were Drs. Doris F. Hopkins, Chicago, on "Allergy in General Medicine"; Raymond J. Jackman, Rochester, Minn., "Anorectal Disease"; Richard C. Adams, Rochester, "Anesthesia in Proctology," and Elmer L. Sevringhaus, Madison, on "Office Management of Diabetes." At an evening banquet Drs. Raymond G. Arveson, Frederic, president of the state society, and Eben J. Carey, Milwaukee, made addresses.

WYOMING

State Medical Election.—Dr. Roscoe H. Reeve, Casper, was named president-elect of the Wyoming State Medical Society at the annual meeting at Sheridan, August 11-13, and Dr. Peter M. Schunk, Sheridan, became president. Dr. Donald G. MacLeod, Jackson, was elected vice president and Drs. Marshall C. Keith and Frederick L. Beck, both of Cheyenne, were reelected secretary and treasurer, respectively.

PUERTO RICO

Inter-American Institute for Hospital Administrators.—Plans for an Inter-American Institute for Hospital Administrators to be held in San Juan, December 1-14, have been announced. The institute will be sponsored by the American College of Hospital Administrators, the University of Puerto Rico, the School of Tropical Medicine, the Puerto Rico Medical Association, the Puerto Rico Health Department, the Hospital Council of Puerto Rico and the Territorial Charity Board of Puerto Rico. It is planned to have lectures and discussions at the morning sessions, demonstrations in the hospitals in the afternoons and round table conferences in the evenings. Members of the executive committee, all of San Juan, are:

Juan B. Soto, Ph.D., chancellor of the University of Puerto Rico, San Juan, president of the committee.
Dr. Eduardo Garrido Morales, San Juan, commissioner of health of Puerto Rico.
George W. Bachman, Ph.D., director of the School of Tropical Medicine, San Juan.
Dr. Oscar Costa Mandry, San Juan, president, Puerto Rico Medical Association.
Dr. Leopoldo Figueroa, San Juan, president of the Territorial Charity Board.
Dr. Ramón M. Suárez, San Juan, president of the Board of Medical Examiners.
Mr. Felix Lamela, San Juan, president of the Puerto Rico Hospital Council.
Dr. Ramón H. Señeriz, acting director of the Bayamón District Hospital, Bayamón.
Mr. Robert Boyd, administrator of the Presbyterian Hospital, San Juan.

Information about the institute may be obtained from Mr. Lamela, executive secretary of the School of Tropical Medicine, San Juan, or from Mr. Gerhard Hartman, American College of Hospital Administrators, 18 East Division Street, Chicago.

GENERAL

Meeting of Railway Surgeons.—The fifty-first annual meeting of the American Association of Railway Surgeons will be held at the Palmer House, Chicago, September 16-18, under the presidency of Dr. Leonard A. Ensminger, Indianapolis. Among the speakers will be:

Dr. John Albert Key, St. Louis, Local Use of Sulfanilamide in Compound Fractures and Other Wounds.
Dr. Michael L. Mason, Chicago, Plastic Surgery and Repair.
Dr. Casper F. Hegner, Denver, Chest Injuries.
Drs. Sidney O. Levinson, Frank E. Rubovits Jr. and Heinrich Necheles, Chicago, The Clinical and Physiologic Aspects of Human Serum Transfusions.
Dr. Joseph F. Prinzing, Denver, Hernia.
Drs. Edward A. Oliver, Chicago, Louis Schwartz and Leon H. Warren, U. S. Public Health Service, Occupational Leukoderma.
Dr. John D. Shingle, Cheyenne, Wyo., Tick Fevers.
Dr. Newell C. Gilbert, Chicago, Reflex Causes for Anginal Pain.
Dr. Andrew C. Ivy, Chicago, Recent Developments in Gastric Physiology.
Dr. Harold N. Segall, Montreal, Canada, The Aging Process.

At the annual banquet Tuesday evening, September 17, the guest speaker will be Mr. William Martin Jeffers, president of the Union Pacific Railroad, Omaha, on "The Importance of a Medical Department in Industry."

Academy of Ophthalmology and Otolaryngology.—The forty-fifth annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held in Cleveland, October 6-10, with headquarters at the Hotel Cleveland and under the presidency of Dr. Frank E. Brawley, Chicago. The meeting will open with a general session Monday morning and mornings thereafter will be devoted to instructional courses. Scientific meetings of the sections on ophthalmology and otolaryngology will be held on alternate afternoons. Speakers at the opening session will be Drs. Brawley, who will deliver his presidential address; Secord H. Large, Cleveland, guest of honor at the meeting; Elmer L. Sevringhaus, Madison, Wis., on endocrinology, and Jacques J. Bronfenbrenner, Ph.D., St. Louis, on allergy. Among other speakers will be:

Dr. Walter B. Hoover, Boston, Progressive Gangrenous Ulcers of the Nose.
Dr. Frank R. Spencer, Boulder, Colo., Research Report: The Effect of Chemotherapy upon the Tubercle Bacillus with Special Reference to Sulfapyridine.
Dr. Hedwig S. Kuhn, Hammond, Ind., An Appraisal of Visual Defects in Industry.
Drs. Francis Bruce Fralick and Max M. Peet, Ann Arbor, Mich., The Fundi in Hypertensive Disease Before and After Splanchnicectomy.
Dr. Joseph D. Kelly, New York, Operative Treatment of Bilateral Abductor Paralysis.
Drs. Chevalier Jackson and Chevalier L. Jackson, Philadelphia, Cancer of the Larynx—Its Increasing Incidence.
Dr. James W. Cheney, Wichita, Kan., Neoprontosil Treatment of Trachoma.
Drs. Algernon B. Reese and Hayes E. Martin, New York, The Treatment of Retinoblastoma by Radiation.

Immediately following this meeting, the first Pan American Congress of Ophthalmology will be held, October 11-12, under the auspices of the academy.

CANADA

Public Health and Medical Meetings.—The twenty-ninth annual meeting of the Canadian Public Health Association will be held in Winnipeg, September 19-21, in conjunction with the annual meeting of the Manitoba Medical Association. The two associations will hold two joint sessions and a joint luncheon and dinner. At the first joint session there will be a preliminary report of a survey of maternal mortality made in Manitoba by the department of health and public welfare, the medical association, the department of pensions and national health and the Rockefeller Foundation. Dr. John A. Ferrell, associate director of the International Health Division of the Rockefeller Foundation, New York, will be chairman of this session. At other sessions speakers will include Drs. John G. Cunningham, Toronto, on industrial hygiene and national defense; Claude E. Dolman, Vancouver, B. C., present status of milk-borne disease hazards, and J. S. Fulton, D.V.S., Saskatoon, Sask., contagious abortion of cattle and undulant fever in man. At a public meeting Dr. Harold W. Wookey, Toronto, will speak on cancer control and Dr. Donald H. Williams, Vancouver, recent progress in control of venereal disease.

CORRECTIONS

Argentine Memorial Day.—In the letter from Buenos Aires published in THE JOURNAL, July 27, page 314, in the last sentence, "Uruguayan memorial day" should have been "Argentine memorial day."

Yellow Fever on Ship from South America.—A news item was published in THE JOURNAL, August 24, under the heading "Yellow Fever on Ship from South America." It was reported that five cases of yellow fever were found on a British ship that had touched at Freetown, West Africa, but the item as published omitted mentioning that the ship started from Buenos Aires, Argentina. According to information received from Dr. Hugh S. Cumming, Washington, D. C., director of the Pan American Sanitary Bureau, the nature of the disease in these cases is still under investigation, the diagnosis being clinical only to date (September 4).

Government Services

Marine Hospital Enlarged

An addition to the U. S. Marine Hospital at Stapleton, N. Y., providing 305 more beds and other facilities was recently opened and occupied. The cost of construction was more than $1,100,000, according to *Public Health Reports*. The addition brings the capacity of the hospital to more than 1,000 beds. It provides medical, surgical, psychiatric and other special care annually to more than 50,000 legal beneficiaries, it was said.

Mental Hygiene Consultation Service

The U. S. Public Health Service has established a new office, that of mental hygiene consultant to the states, for the purpose of encouraging and giving aid in the organization of state mental hygiene programs, with Passed Assistant Surgeon Victor H. Vogel in charge. Mental health projects will be recognized as approved objects for expenditure of Title VI Social Security funds allocated to state health departments for the extension of public health work.

Specialist in Tuberculosis Control for Indian Service

Dr. Horace De Lien, special physician in tuberculosis control, has been assigned to duty in the office of the district medical director, U. S. Indian Service, San Francisco, to assume direction of tuberculosis control activities among the Indian population of California. Dr. Lien has recently completed one year of educational experience at the Henry Phipps Institute of Philadelphia, previous to which he was in charge of the Indian Service Sanatorium at Fort Bidwell, Calif., now discontinued. Dr. Lien's activities will be extended to include tuberculosis control among Indians in Nevada and Utah in the near future. A recent x-ray survey of about 1,200 Mission Indians in Southern California revealed that about 1 per cent had significant tuberculosis, exclusive of primary lesions. In comparison with other groups of California Indians, this indicates a relatively low incidence of tuberculosis.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 6, 1940.

Compulsory Service of Physicians

The government is taking measures to ensure that hospitals and other medical services shall be adequately staffed with physicians. The Emergency Powers Act gives power to direct physicians to perform such services as may be specified. For the present the application of the act will be confined to physicians within two years of becoming qualified. This power will be exercised by the senior officers of the Ministry of Health, in which they will be advised by the central medical war committees of England and Wales and of Scotland. These committees already advise on the medical recruitment of the armed forces.

Medical Students and the War

The medical profession has been profoundly affected by the war. The younger physicians have been conscripted for military and naval service and most of the older ones are engaged in national service, such as examination of recruits for the fighting services, staffing of hospitals and first aid for civilian casualties from air raids. The life of the medical student is also greatly affected, though the authorities want to interfere with his studies as little as possible. The great hospitals in the cities have been converted into casualty clearing stations for the large numbers of wounded expected from air raids, which so far have not materialized, and the normal work of these hospitals has, as far as possible, been shifted to hospitals in safer areas in the surrounding country. This has meant a great disruption of teaching. Other effects are illustrated by the following:

More than 300 students of Leeds University Medical School will give up their long vacation to join a scheme of voluntary civil defense, which is designed to interfere as little as possible with their studies. The students are divided into three groups. The first group consists of sixty students due to take their final examination soon. They will serve in Leeds hospitals should air raids become severe. In the second group are 150 who have done at least six months of clinical work and not more than two and one-half years of hospital work. They are allocated to staffs of hospitals and are being trained to act as assistants to surgeons and anesthetists and as stretcher bearers while continuing their own work. The third group consists of 100 who have done less than six months of clinical work and more than two terms of anatomy and physiology. They are receiving an intensive course in first aid training and antigas work, and it is proposed to use them as mobile first aid squads.

The Physical Education of Youth

The war has increased attention to nutrition and physical training. In a debate in the House of Lords on the physical training of youth Lord Dawson said that good nutrition and physical education must go hand in hand. Fortunately in this country nutrition was going steadily forward. One of the cheapest campaigns which the Board of Education could institute would be to send vans to the rural districts where people could be shown how to choose and cook food. Physical education had been neglected because of the fallacy that education was necessary for the mind but not for the body. Our educators had not even been aroused by what had been going on in Germany in the last twenty years. But a good side of the picture was the progressive introduction of physical training into schools and the result was seen in a great improvement in physique. However, for most children physical training stopped at 14, the most critical age. The vital adolescent years were left to drift and the quality of the body to deteriorate. That

character did not deteriorate was remarkable. On the other hand, the Germans dealt thoroughly with the period of adolescence. At the very time when the influence of urbanization, mechanization and hustle needed counteracting by the building of individuals with bodies and minds self made, not machine made, we were without the means of training. In this crisis of our history the strength and endurance of our man power, including that of our youth, was vital. A director of physical education, with a small staff, should be appointed with even compulsory powers to direct physical education from the age of 14 upward. His work should be through existing organizations as far as possible. At 18 the training would be based on the War Office. Those in training would require supplementary nutrition. Milk was the solution of that.

Replying for the government, Viscount Clifden said that it was difficult to see how any compulsory scheme of training, even if desirable, could work effectively. It would lead to misrepresentation and might jeopardize general acceptance of more comprehensive training. Three factors were increasing the opportunities for young people to get regular training and recreation: 1. The Ministry of Labor and Board of Education are for the first time to be brought into direct contact with the large numbers of girls and boys in factories not now associated with any youth organization. It would be possible to make a direct appeal to them and provide adequate facilities. 2. All large voluntary organizations had agreed as a special wartime emergency measure to open their doors to all comers. 3. The Central Council of Recreative Physical Training and the football association had launched a scheme for training men and boys from 16 upward.

Homes in Australia and Canada for Physicians' Children

Schemes for the transporting of British children to the dominions, where they will be free from the war dangers which threaten the civilian population, are being pushed forward; but transport offers difficulties. Because of the possibilities of attacks by submarines, convoy is considered necessary and at the present moment the government cannot spare this. A special scheme for physicians' children is being arranged. Australian physicians have offered to take into their homes British physicians' children under the age of 16, either accompanied or unaccompanied by their mothers, to a total of 500. The arrangements will be made between the secretary of the British Medical Association and the secretary of the federal council of the British Medical Association in Australia. Parents will be responsible for the passage money and education, and maintenance will be the subject of individual arrangements. Physicians in Canada have offered to open their homes to 1,100 unaccompanied children of British physicians evacuated by the government and selected by the Children's Overseas Reception Board.

BUENOS AIRES

(From Our Regular Correspondent)

Aug. 9, 1940.

Psychoses in Relation to Language Isolation

Dr. E. Eduardo Krapf, director of a division in a large hospital for mental diseases in Buenos Aires, the Hospicio de las Mercedes, reported to the society for neurology and psychiatry a study of mental disorders in immigrants attributable to their ignorance of the native language. Fifteen years previously A. Ameghini had called attention in Buenos Aires to the fact that, while two thirds of the population of the country consisted of native stock, two thirds of the inmates of institutions for mental diseases were recruited from immigrant stock. His observations were confirmed and the same condition has been found in some other states. Spencer L. Dawes records similar observations (*Am. J. Psychiat.* **4**:449 [Jan.] 1925) for the state of New York. Statistics such as these need to be cautiously evaluated, since differences of age level must be taken into account. Immigrants represent largely the higher age levels in which the incidence of mental diseases is likely to be greater. Besides, immigrants are apt more frequently than natives to be without families and homes and hence more apt to be consigned to an institution. Other factors involve brooding over expatriation and nostalgia. Heredity and constitutional factors are also involved. Emigration from one's native land may itself be a sign of disturbed mentality or the social consequence of premorbid conditions or of unsteady character. Economic difficulties, hunger and wretchedness may also have pathogenic significance, tending to weaken the will to live. Temporary inability to adapt oneself to new climatic conditions frequently exercises a damaging effect. Krapf had stressed, in a previous article, the meaning of "shock," involved in the difference of seasons for the northern and southern hemisphere. The time during which adjustment to new atmospheric conditions had to be made represented a dangerous period of increased psychophysical lability and was indicated by depression in immigrant women. Usually complete and permanent recovery occurred after a few months. Disturbances arising from difficulties of adjusting oneself mentally to the national and social environment in a new country also play their part. Isolation and the feeling of loneliness may induce mental upsets either directly or concomitantly. It may be assumed that the psychologic relations between nostalgia and mental disorders are rooted primarily in a sense of loneliness. Psychoses due to the failure of adapting oneself mentally occur among all categories of immigrants, but they are peculiarly and with greater frequency observable, in Argentina, among immigrants of non-Latin stock, owing to their ignorance of the language of the country. This condition is similar to certain mental reactions observed in the deaf. Immigrants lacking the knowledge of Spanish lack an important means of social intercourse. In his study of the inmates of the Hospicio de las Mercedes, Krapf found in 1937 that among 215 inmates of non-Latin origin seventy-two (33.5 per cent) showed paranoic psychoses of all types, whereas only forty-two (19.5 per cent) of the inmates of Spanish descent were so affected. These observations agree with data gathered in New York by Benjamin Malzberg (*Psychiat. Quart.* **10**:127 [Jan.] 1936) in which forms of paranoia predominated in persons of Latin stock, clearly a sign of the effect of mental isolation due to ignorance of the language spoken in the country.

Marriages

JOHN B. LARSON, Laurens, Iowa, to Miss Elizabeth Shortridge of Sioux Falls, S. D., in Remsen, Iowa, July 15.

LINCOLN BRUCE DONALDSON, Evanston, Ill., to Miss Gertrude Hagar Galloway at Hubbard Woods, June 29.

PRESTON DE WITT CONGER, Tifton, Ga., to Miss Mary Nell Morgan in Lakeland, Fla., June 23.

WILLIAM GEORGE MEYER, New York, to Miss Helen Hensel O'Hara of Dayton, Ohio, in June.

EUGENE A. SULLIVAN, Amboy, Ill., to Miss Alice Florence Crandall of Des Plaines, June 29.

RAVIS AARON BRANNON JR. to Miss Elizabeth Virginia Hudson, both of Utica, Miss., June 23.

FREDERICK TAYLOR MERCHANT, Marion, Ohio, to Miss Ethyl Rush of Columbus, Ind., in June.

FRANKLIN G. RUDOLPH, Hammond, Ind., to Miss Alene Bowman at Odon, Ind., August 3.

ROBERT LYMAN NELSON to Miss Phyllis Shaw, both of Duluth, Minn., June 1.

ALBERT L. MARSHALL JR., Indianapolis, to Miss Mary Cox of Odon, Ind., July 27.

FRANCIS DRAKE KENDALL, Columbia, S. C., to Miss Lella Lindler in June.

Deaths

Hans Zinsser ✠ Boston, eminent as a scientist, physician and author, died in New York, September 3, of leukemia at the age of 61. Dr. Zinsser had just published his autobiography under the title "As I Remember Him," and in this book he had forecast his death (THE JOURNAL, August 10, p. 481).

Hans Zinsser was born in New York in 1878. He received his A.B. degree from Columbia University in 1899 and his A.M. degree in 1903, and the honorary degree of D.Sc. was conferred on him by Columbia in 1929. After his graduation in medicine in 1903, he served an internship from 1903 to 1905 and then began his career as bacteriologist at the Roosevelt Hospital and the College of Physicians and Surgeons. For five years he served as instructor in bacteriology and hygiene in this institution and was also assistant pathologist in St. Luke's Hospital. He then became assistant professor and later professor of bacteriology at Stanford University. In 1913 he returned to Columbia as professor of bacteriology and remained until 1923, at which time he joined the staff of Harvard Medical School as professor of bacteriology and immunology, a position which he occupied until his death. He was consulting bacteriologist to the Children's Hospital and the Peter Bent Brigham Hospital. During World War I he served as major in the United States Army Medical Corps and later was promoted to the rank of colonel. He was sanitary inspector of the First Army Corps and of the Second Field Army of the A. E. F. in France and also was assistant director of laboratories and infectious diseases for the Expeditionary Force. In the summer of 1923 he went to Russia for the League of Nations Health Section as sanitary commissioner. In 1935 he was exchange professor in Paris and in 1938 at Peiping Union Medical College. For his work he was awarded the Distinguished Service Medal of the United States government, the Legion of Honor of the French government and the Order of St. Sava of the Serbian government.

HANS ZINSSER, M.D., 1878-1940

Dr. Hans Zinsser was widely recognized as an authority in his field and held memberships in the National Academy of Science, the American Philosophical Society, the American Association for the Advancement of Science, the American Academy of Arts and Sciences, the Harvey Society, the Society for Experimental Biology and Medicine, the Association of Pathologists and Bacteriologists, the Society of American Bacteriologists, the American Association for Cancer Research, and the American Society for Experimental Pathology, also the American Academy of Tropical Medicine, the American Association of Immunologists, the American Public Health Association, the Association of American Physicians, the American Birth Control League, the American Committee for the Control of Rheumatism, the American Epidemiological Society and other organizations. He had been honored by election to membership in the Alpha Omega Alpha and Sigma Xi. Honorary degrees were awarded not only by Columbia but also by Western Reserve, Lehigh, Yale and Harvard.

Dr. Hans Zinsser began his writing first as a contributor of innumerable periodical articles to medical science, his books including the Textbook of Bacteriology, 1911; his work on Infection and Resistance and later his work on Resistance to Infectious Diseases, published in 1931, and last year a new edition of his work on Immunity. In the midst of his scientific career, in which he achieved recognition as one of the foremost bacteriologists of our times, he took part in the campaign against typhus and had recently announced the development of a technic for the mass production of vaccine against this plague.

Coincidentally he produced in 1935 his book on "Rats, Lice and History," which became a best seller. He was a philosopher, historian, poet and wit, and he had contributed poetry to many leading periodicals. This year appeared the biography of R. S. under the title "As I Remember Him," in which he described in the third person the life of Hans Zinsser. The book became at once a nonfiction best seller and was the choice of the Book of the Month Club for July. Not only are the initials R. S. the last letters of his name, Hans Zinsser, but they were chosen also because they meant to him "romantic self." The paragraphs in which he wrote of his own death are a remarkable contribution. He wrote:

> Something took place in his mind that he regarded as a sort of compensatory adjustment to the thought that he would soon be dead. In the prospect of death, life seemed to be given a new meaning and fresh poignancy. . . . From now on, instead of being saddened, he found—to his own delighted astonishment—that his sensitiveness to the simplest experiences, even for things that in other years he might hardly have noticed, was infinitely enhanced. . . .
>
> As the disease caught up with him R. S. felt increasingly grateful for the fact death was coming to him with due warning, and gradually. So many times in his active life he had been near sudden death by accident, violence or acute disease; and always he had thought that rapid and unexpected extinction would be most merciful. But now he was thankful that he had time to compose his spirit and to spend a last year in affectionate and actually merry association with those dear to him.

Dr. Hans Zinsser was a courageous investigator, the possessor of an extraordinary mind, a tolerant, judicial, scientific leader. His contribution to the world was significant. His death at the early age of 61, no doubt, deprives mankind of many another work of permanent importance.

Charles Bert Reed ✠ Chicago; Rush Medical College, Chicago, 1887; member of the House of Delegates of the American Medical Association from 1933 to 1940 and delegate at special sessions in 1935 and in 1938; demonstrator of obstetrics at Northwestern University Medical School from 1903 to 1906, assistant professor from 1906 to 1912 and associate professor since 1931; past president of the Illinois State Medical Society and the Chicago Medical Society; treasurer of the Chicago Gynecological Society from 1904 to 1909 and from 1910 to 1929 and president 1909-1910; fellow of the American College of Surgeons; chief obstetrician to the Wesley Memorial Hospital; attending obstetrician to the Cook County Hospital from 1902 to 1906; author of textbooks entitled "Obstetrics for Nurses" and "Operative Obstetrics on the Manikin" and many others; aged 74; died, September 3, in Sand River, Ont., of heart disease.

Maurice Oliver Magid ✠ New York; Cornell University Medical College, New York, 1905; past president of the Bronx County Medical Society, the Bronx Gynecological and Obstetrical Society; the New York Physicians' Association; chairman and formerly secretary of the Joint Committee of the Organized Medical and Dental Professions of the City of New York; at one time instructor in gynecology at the New York Polyclinic Medical School and Hospital; aged 57; was a director, chairman of the medical board and a founder of the Hunts Point Hospital; on the staff of the Bronx Hospital, where he died, July 31.

William Vincent Whitmore, Tucson, Ariz.; University of Southern California College of Medicine, Los Angeles, 1890; member of the House of Delegates of the American Medical Association in 1910; past president of the Arizona State Medical Association and the Pima County Medical Society; for many years member of the school board; formerly member of the

board of regents of the University of Arizona; aged 78; died, July 24.

William M. Cole, Long Beach, Calif.; Manitoba Medical College, Winnipeg, Man., Canada, 1913; member of the California Medical Association; fellow of the American College of Physicians; served with the Canadian Army during the World War; on the staffs of the Seaside Memorial Hospital, St. Mary's Hospital and the Community Hospital; aged 48; died, July 9, in the Compton (Calif.) Sanitarium of coronary sclerosis.

Otto H. Crist, Danville, Ill.; Northwestern University Medical School, Chicago, 1906; member of the Illinois State Medical Society; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; past president of the Wabash Valley Aesculapian Society; on the staffs of the Lakeview and St. Elizabeth's hospitals; aged 61; died, August 7, of coronary thrombosis.

Frank A. Stubblefield, Brighton, Ill.; Missouri Medical College, St. Louis, 1882; physician at the Jacksonville (Ill.) State Hospital from 1902 to 1914 and the Alton (Ill.) State Hospital from 1914 to 1916, when he was appointed managing officer of the Chester State Hospital, Menard, where he served until 1934; aged 84; died, July 27, at the Alton (Ill.) Memorial Hospital of cardiorenal disease.

Marion R. Hammer, Newton, Iowa; Northwestern Medical College, St. Joseph, Mo., 1881; King Eclectic Medical College, Des Moines, 1889; member of the Iowa State Medical Society; past president of the Jasper County Medical Society; formerly city physician and county coroner; on the courtesy staff of the Mary Frances Skiff Memorial Hospital; aged 87; died, July 11, of cerebral hemorrhage.

Cloyce Robert Tew, Raleigh, N. C.; Johns Hopkins University School of Medicine, Baltimore, 1931; member of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; secretary of the Wake County Medical Society; on the staff of the Rex Hospital; aged 33; died, July 11, of a self-inflicted bullet wound.

Thomas Jefferson Marcus, Clanton, Ala.; Memphis (Tenn.) Hospital Medical College, 1910; member of the Medical Association of the State of Alabama; past president and secretary of the Chilton County Medical Society; aged 69; on the staff of the Central Alabama Hospital, where he died, July 30, of heart disease.

Alex Malcolm Macaulay ✠ Great Falls, Mont.; Manitoba Medical College, Winnipeg, Man., Canada, 1907; fellow of the American College of Surgeons; served during the World War; member of the visiting staff of the Columbus Hospital; aged 63; died, July 23, in Conrad of gangrenous appendicitis.

Joseph Edward Gately ✠ Baltimore; University of Maryland School of Medicine, Baltimore, 1902; served during the World War; aged 60; on the staffs of the Johns Hopkins Hospital and St. Joseph's Hospital, where he died, July 21, of cerebral hemorrhage, embolism and coronary infarction.

James Rufus Rogers, Raleigh, N. C.; College of Physicians and Surgeons, Baltimore, 1886; member of the Medical Society of the State of North Carolina; aged 73; for many years on the staff of the Rex Hospital, where he died, July 5, of acute mesenteric thrombosis and diabetes mellitus.

Charles R. Teeter, Russellville, Ark.; University of Arkansas School of Medicine, Little Rock, 1907; member of the Arkansas Medical Society; for many years member of the school board of Pottsville; aged 65; died, July 13, in St. Vincent's Infirmary of carcinoma of the right kidney.

Frank H. Green ✠ Rushville, Ind.; University of Indianapolis Medical Department, 1897; past president of the Rush County Medical Society; formerly county coroner; served during the World War; owner of a hospital bearing his name; aged 63; died, July 30, of carcinoma of the liver.

Rollin John Smith, Appleton City, Mo.; Missouri Medical College, St. Louis, 1887; member of the Missouri State Medical Association; aged 79; died, July 20, in the Trinity Lutheran Hospital, Kansas City, of hypertensive cardiovascular disease, cerebral hemorrhage and arteriosclerosis.

Charles Alex Van Slyke ✠ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1891; an Affiliate Fellow of the American Medical Association; aged 75; died, July 21, in St. Joseph's Hospital of bronchopneumonia following a fracture received in a fall.

Daniel Sayer Hardenberg, Jersey City, N. J.; Columbia University College of Physicians and Surgeons, New York, 1904; member of the Medical Society of New Jersey; aged 60; on the staff of the Christ Hospital, where he died, July 28, of hypertensive heart disease.

James Moffatt Alexander, Statesville, N. C.; Georgetown University School of Medicine, Washington, D. C., 1925; member of the Medical Society of the State of North Carolina; aged 39; died, July 6, in Broadoaks Sanatorium, Morganton, of chronic myocarditis.

William Herbert Wardell, Moose Jaw, Sask., Canada; Manitoba Medical College, Winnipeg, 1902; fellow of the American College of Surgeons; on the staffs of the Moose Jaw General and Providence hospitals; aged 69; died, June 4, of carcinoma of the stomach.

Robert Walter Frischkorn, Washington, D. C.; George Washington University School of Medicine, Washington, 1904; veteran of the Spanish-American War; aged 64; died, August 2, in the Providence Hospital of acute nephritis and coronary occlusion.

Charles Walice Gardner, Mount Pleasant, Iowa; College of Physicians and Surgeons, Keokuk, 1894; member of the Iowa State Medical Society; aged 82; died, July 26, in the Mercy Hospital, Burlington, of hypertrophy of the prostate and heart disease.

Martin Luther Bomberger, Lebanon, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1940; aged 30; intern at the Harrisburg (Pa.) Hospital, where he was found dead in bed, July 8, of a self-inflicted incised wound of the throat.

Francis Evans Wynne ✠ Baxter Springs, Kan.; University of Kansas School of Medicine, Kansas City, 1933; president of the Cherokee County Medical Society; aged 31; died, July 30, in the McCune-Brooks Hospital, Carthage, Mo., of poliomyelitis.

Bernard Andrew Bailey, Wiscasset, Maine; Dartmouth Medical School, Hanover, N. H., 1890; member of the Maine Medical Association; served during the World War; aged 70; died, July 18, of cerebral embolism and chronic nephritis.

Joseph Payson Clark, Boston; Harvard Medical School, Boston, 1887; member of the Massachusetts Medical Society; past president and treasurer of the American Laryngological Association; aged 80; died, July 21, of arteriosclerosis.

Joseph Maurice Jackson, Pittsburgh; Columbia University College of Physicians and Surgeons, New York, 1899; for many years on the staff of the Montefiore Hospital; aged 63; died, July 31, in Long Beach, Calif., of coronary thrombosis.

Robert Maclay Smith, Gonzales, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1909; member of the Louisiana State Medical Society; aged 57; died, July 28, in Jackson of a fracture of the hip and pneumonia.

Eugene Rankin Cocke, Asheville, N. C.; Jefferson Medical College of Philadelphia, 1913; member of the Medical Society of the State of North Carolina; served during the World War; aged 53; died, July 14, of mesenteric thrombosis.

Bernard Edward Bauman, St. Louis; St. Louis University School of Medicine, 1936; resident in tuberculosis at the Mount St. Rose Sanatorium; aged 34; died, August 4, of an injury received when he dived into shallow water.

John Thomas Guynes, Jourdanton, Texas; University of Tennessee College of Medicine, Memphis, 1914; member of the State Medical Association of Texas; health officer; aged 57; died, July 21, of coronary occlusion.

Myron Preston Denton ✠ New York; Harvard Medical School, Boston, 1887; an Affiliate Fellow of the American Medical Association; aged 80; died, July 22, in the General Hospital, Saranac Lake, of uremia.

James Henry Johnson, Hillsdale, Mich.; Detroit College of Medicine, 1897; member of the Michigan State Medical Society; served during the World War; aged 64; died, July 31, of lung tumor and abscess.

Harvey D. Miller, Myerstown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1896; aged 68; died, July 31, in St. Joseph's Hospital, Reading, of coronary and cerebral sclerosis.

Frank Lester Bigsby, Kirksville, Mo.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; served during the World War; aged 62; died, July 27, of arteriosclerosis.

Toby Anthony Greco, Margate City, N. J.; Jefferson Medical College of Philadelphia, 1916; member of the Medical Society of the State of Pennsylvania; aged 46; died, July 18, of coronary occlusion.

Correspondence

THE TREATMENT OF POLYCYTHEMIA BY THE INDUCTION OF AN IRON DEFICIENCY STATE

To the Editor:—Reznikoff (THE JOURNAL, July 27, p. 298) has recently questioned the rationale of our method of treatment in polycythemia (Dameshek, William, and Henstell, H. H.: *J. Clin. Investigation* **16**:683 [July] 1937; *Ann. Int. Med.* **13**:1360 [Feb.] 1940), which combines systematic phlebotomy with a low intake of iron. He states that "most of these patients have a fairly normal color index, . . ." which is directly contrary to our experience and that of others, and that he does not understand "why cutting the iron down inhibits cell production. . . ."

What one must aim for in the rational treatment of the disease is not simply reduction in red cell count but reduction of the total red cell mass, as Haden (*Am. J. M. Sc.* **196**:493 [Oct.] 1938) puts it. In this endeavor the greatest emphasis is laid on the figures for hemoglobin, hematocrit and red cell volume with but little reference to the red cell count. Our method, which has now been in successful use for more than five years, is based on the development of an iron deficiency state through a series of systematic venesections and its prolongation by the use of a diet low in iron.

In a fresh case of polycythemia (hemoglobin 140 per cent, red blood cells 9 million, hematocrit 75 per cent) venesections of 500 cc. of blood are performed twice a week until the hemoglobin content is reduced to approximately 80 to 85 per cent, red blood cells from 5 to 5.5 million, and the hematocrit reading from 42 to 45 per cent. Ordinarily, this requires from six to eight venesections. The patient is then given a diet low in iron, containing approximately 6 mg. of iron a day. This requires avoidance of red meat, meat soups, liver, eggs, rye bread and brown cereals. Fowl once a week, fish twice a week, cheese, milk and legumes give sufficient protein.

The method was instituted because of our disappointment with the uncertainties and dangers inherent in the use of x-rays, phenylhydrazine, acetyl phenylhydrazine and solution of potassium arsenite as well as through a fortuitous circumstance. One of our patients, poorly controlled with the measures mentioned, had an unusually severe hematemesis—due to peptic ulcer—and was placed on a Sippy regimen. It was noted that, although the red cell count rose to fairly high levels after a few months, the hemoglobin concentration remained consistently low. What is more, there was complete relief in all the symptoms of the polycythemic state. It was reasoned that a state of chronic hypochromic "anemia" (hemoglobin 70 per cent, red blood cells 5-6-7 million) had been induced by means of hemorrhage combined with the low iron content of the orthodox Sippy diet.

It was therefore proposed to imitate severe hemorrhage in other cases of polycythemia by performing venesections twice a week for several weeks. This procedure, particularly when combined with a low dietary intake of iron, results in a loss of hemoglobin from the body and ultimately in a depletion of the bodily stores of iron. Such a method has for many years been successfully used by Whipple and his collaborators in their colony of anemic dogs, and its results are analogous to the condition found in chronic "primary" or "idiopathic" hypochromic (iron deficiency) anemia of adult women. Reductions are obtained in the color index, mean corpuscular volume, mean cell diameter and mean corpuscular hemoglobin concentration. These reductions become more pronounced as the red cell count begins to rise, while the hemoglobin and hematocrit percentages remain at fairly constant levels. It is apparent that, although the bone marrow continues to produce unusually large numbers of erythrocytes, the lack of sufficient iron within the body must necessarily result in a diminution in hemoglobin concentration of each individual red cell and in the production of small red blood cells. As a result, the hemoglobin concentration in the blood remains low and the red cells become more and more hypochromic and small. Thus from six to twelve months after a series of venesections it is not unusual to see figures such as these: hemoglobin 85 per cent, red blood cells 8.5 million, color index 0.5, hematocrit 50 per cent, mean corpuscular volume 60 cubic microns, mean cell diameter 6.5 microns.

Under such circumstances the outcome of the red cell count becomes a minor consideration. Of major importance are the hemoglobin and hematocrit percentages. With low values for hemoglobin the hematocrit percentage is necessarily low whatever the red cell count, and low or normal values are obtained for blood viscosity, total blood volume, red cell volume and red cell mass. When all these figures are either low or normal, the numerous symptoms of polycythemia usually disappear completely, to return when the hemoglobin and hematocrit percentages again become definitely increased (usually within six to twelve months).

As Minot and Castle (1939 Year Book of General Medicine, p. 329) state: "Treatment of the disease has recently become distinctly more satisfactory because of recognition of the physiologic basis of the beneficial effects of repeated venesections and its consequent more intelligent application. . . . Repeated bleedings . . . eventually lead to the development of a hypochromic blood picture with, as in any form of chronic blood loss, diminished blood regeneration." From the physiologic standpoint it would seem likely that restriction of the iron content of the diet would help to maintain a chronic state of iron deficiency. This has not yet been entirely established, although we have evidence that such reduction prolongs the period of remission between venesections (average eight months in our cases).

WILLIAM DAMESHEK, M.D., Boston.

RETENTION CATHETER OR INTERVAL CATHETERIZATION

To the Editor:—The discussion by Dr. Samuel N. Vose of Boston (THE JOURNAL, August 10, p. 475) of my paper (*ibid.*, June 15, p. 2368) disagrees with abolition of the retention catheter in preoperative preparation of prostatic patients. Since the point at issue has a rather important bearing on the care of thousands of patients in our hospitals annually, it is to be hoped that others besides Dr. Vose will make and report observations to sustain or refute my contention that interval catheterization should supersede the retention catheter. I am convinced that the almost universal use of the retention catheter is due to uncritical acceptance of the dictums of the past and that the custom will not stand the test of clinical comparison with intermittent catheterization.

To take up the specific points of Dr. Vose's discussion, I must express my doubt concerning the adequacy of the measures for management of the retention catheter on which he relies to prevent complications. The shortcomings of the retention catheter are not to be overcome by attention to such details as shaving the pubic hair and closed irrigating systems, laudable as these all may be. There is doubtless a certain advantage in the self-retaining balloon catheter which Dr. Vose prefers, but external retaining devices properly applied cannot justly be blamed for the febrile episodes and purulent urethritis so commonly associated with use of the retention catheter. No refinement of technic can hope to secure absolutely aseptic insertion of a catheter; the anterior urethra itself is not usually sterile (Schulte, T, L.: Newer Methods in a Study of the Bacteriology of the Urinary Tract, *Proc. Staff Meet., Mayo Clin.* **14**:249

[April 19] 1939), and least of all that of prostatic patients, who often have been carelessly catheterized before entering the hospital. The basic fault of the retention catheter is that it continuously and harshly traumatizes the urethra. Gross infection then inevitably follows in spite of all care.

Dr. Vose thinks that extremely small retention catheters (even No. 12 French) would suffice for vesical drainage and would allow ample space for the escape of "secretions" around the catheter. I have grave misgivings as to the reliability of so small a catheter, and Dr. Vose admits that in actual practice he uses a No. 16 French catheter. This is in accord with common practice. In any case I feel that, within reasonable limits, the caliber of the retention catheter is not a crucial point. Small or large, a retention catheter, like a cinder in the eye, is a harmful and unpleasant irritant. Dr. Vose concedes this by implication when he stresses the matter of drainage around the catheter. Under a regimen of interval catheterization there need be no concern about urethral drainage, since there will be no discharge, purulent or otherwise.

It is unfortunately not possible to carry out a controlled experiment to settle this question, but the conditions of such a study can easily be postulated. Two sizable groups of healthy young men free from all evidence of infection of the urinary tract would voluntarily submit themselves to a prolonged period of vesical drainage, in the one case with the retention catheter and in the control group with interval catheterization. My experience convinces me that the retention catheter group would show a much higher incidence of complications—in other words that the retention catheter is a device well calculated to make even a well man sick.

My memory carries back to numerous old men who entered various hospitals and proceeded to lapse into febrile coma and die after installation of the retention catheter. These patients never came to surgery and therefore never figured in the mortality tables of prostatic operations; but they were an important element in the total mortality rate of prostatism. Death certificates described the immediate cause of death as "uremia." The rarity of similar cases in my present practice has made me believe that sepsis induced by the retention catheter was a large contributing factor in these deaths.

In personal discussions of interval catheterization of prostatic patients at a recent urologic meeting, several urologists expressed approval of the idea but declared they considered it unfeasible because interns would object to such drudgery. I do not think it necessary or fair to ask interns to assume a task which can be so easily made a routine. Intelligent orderlies quickly learn to perform this duty in a thoroughly satisfactory way. Interval catheterization has seemed so obviously superior and has been so eminently gratifying that I would urge all urologists at least to give it a trial.

RICHARD P. MIDDLETON, M.D., Salt Lake City.

MYASTHENIA GRAVIS

To the Editor:—The report of an apparently miraculous recovery from myasthenia gravis following implantation of pellets of synthetic adrenal hormone (THE JOURNAL, July 13) will not impress many who are familiar with the disease. The diagnosis in the case may be questioned; furthermore, limited observations on a single case are not convincing.

The young physician thought to be the victim of myasthenia gravis presented symptoms which suggest the results of nervousness and anxiety. It is common for nervous medical students and young physicians to acquire the symptoms of any disease which they happen to study. Did this patient recover from myasthenia gravis or merely from nervous manifestations which simulated it?

A recent editorial in THE JOURNAL pointed out the possible dangers from the indiscriminate use of desoxycorticosterone acetate and condemned the clinical use of the material in conditions in which it had not been proved to be of value. Should not this warning be applied to the use of the material in myasthenia gravis?

FRANK N. ALLAN, M.D, Boston.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

"INTESTINAL FLU"

***To the Editor:*—The clinician tells us there is an entity of "intestinal flu." The bacteriologist says there isn't. Please clarify this problem.**

M.D., Ohio.

ANSWER.—Since the term "intestinal flu" is almost entirely of clinical use, the bacteriologist has not been in a position to pass on its validity. There are apparently outbreaks of disease in which gastrointestinal symptoms and abdominal pain are prominent. This set of symptoms is, however, extremely uncommon in epidemics of influenza. In most instances the so-called intestinal flu is found to be due to water-borne or food-borne bacterial infection. There is little justification for the continued use of the term, since it implies associations which are unwarranted.

ECZEMA OF AUDITORY CANAL

***To the Editor:*—Can you give me suggestions as to the treatment of eczema of the auditory meatus, of many years' standing, in a woman 54 years old? There is so much thickening of the tissues that the opening is practically closed. Blood pressure and other conditions are normal, though the patient is definitely overweight. Is resection or cautery ever justifiable in opening up the canal? It would seem unpractical, but the woman wishes to hear, and it is difficult to do so with the canals closed.**

Melvin A. Drake, M.D., Buhl, Idaho.

ANSWER.—So-called eczema of the auditory meatus differs from dermatitis elsewhere in its inaccessibility and because of the danger of swelling closing the canal. The meatus offers a lodging place for infection from without or from the middle ear and its accumulation of wax and epithelial débris makes a good culture medium for various organisms, saprophytic or pathogenic. These peculiarities must be added to the usual difficulties of an itching dermatosis, eczematoid in character. One must consider (1) contact dermatitis, (2) infectious eczematoid dermatitis, (3) certain forms of dermatitis medicamentosa, (4) neurodermatitis, (5) the result and only outward manifestation of some metabolic disturbance such as an upset sugar metabolism or liver dysfunction, (6) a part of one of the commoner scaly dermatoses such as psoriasis or seborrheic dermatitis, (7) part of one of the rarer cutaneous or general diseases as lymphoblastoma, and (8) a combination of two or more of them.

In a case in which the ear canal is the only part of the skin involved, as is assumed for the case under discussion, the probability lies strongly with the second of these possibilities and a careful search for fungi and bacteria is in order. The scales should be examined for fungi, the exudate for both fungi and bacteria. Before making cultures the canal should be thoroughly cleansed to get rid of most of the saprophytes. E. J. Walen (Fungous Infection of the External Ear, THE JOURNAL, Aug. 6, 1938, p. 502) prefers an alcoholic solution of sodium sulfide for the scales because the ordinary hydroxide solution dissolves some of the fungi. For culture of fungi he uses Sabouraud's or Shaw's medium.

Cultures for bacteria are also important as described by J. H. Mitchell (Streptococcus Dermatitis of the Ears, THE JOURNAL, Jan. 30, 1937, p. 361). The frequency with which an infectious eczematoid dermatitis of the face originates from an ear canal infection is not to be denied. Williams, Montgomery and Powell studied a series of cases of ear dermatitis (Dermatitis of the Ear, THE JOURNAL, Aug. 19, 1939, p. 641). In some they found fungi, in others bacteria and in still others a mixture of these two forms of plant life.

On another occasion Mitchell warned against the use of any but the most soothing of drugs in treating cutaneous infections

without a preliminary patch test of each drug, to protect against the possibility of adding a contact dermatitis to the picture. This is a wise and practical measure. The infection may have found its opportunity to localize in a preexisting sensitization dermatitis. Some years ago White suggested that fungous infections predispose to sensitizations.

Swelling of the walls of the canal can usually be reduced by the use of glycerin tampons, increased in size as the canal is dilated. If the skin is oozing, painting with silver nitrate solution 10 to 50 per cent will often dry it.

The fourth possibility listed must not be forgotten in treating any itching disease, for while primary neurodermatitis is a common skin disease, the neurotic element has to be considered in every case of itching. Rubbing with the finger in the ear canal, or often with more dangerous instruments such as hairpins, can be taken for granted in any case of itching until the patient has been warned of its harmful effect. Even then only those with the greatest self control can resist the urge to scratch or rub. A substitute action must be provided in the application of a soothing lotion such as 1 per cent phenol in alcohol. This should be dropped into the canal in small amounts, or if swabbing is desired the patient or nurse must be warned against the slightest unnecessary rubbing.

Ointments are less satisfactory in the ear canal than elsewhere. Two per cent gentian violet solution in water is an effective antiseptic in many cases and unlikely to cause irritation. Roentgen rays may be found helpful in reducing the inflammation and itching. They may be used in divided doses, 75 roentgens once a week. Some patients get a lasting result from such treatment, but oftener it proves to be only a temporary help. It has the disadvantage that the amount of treatment that can be given with safety is strictly limited and that no irritating applications of any kind can be used with safety in conjunction with roentgen rays or within three weeks after the course of irradiation has ended.

Surgical measures such as those suggested are seldom justified and often lead to further trouble.

UNUSUAL ALOPECIA AREATA

To the Editor:—**A 12 year old girl of Polish extraction complained of intervals of complete alopecia, occurring two or three times a year for the past eight years. Loss of hair takes about one week to be complete and is usually accompanied by mild right frontal headache and slight fever. Following the loss of hair, regeneration seems to have been rapid. There is no association with season or other illness. The only illness in the past history was measles at the age of 2 years, with no apparent complications. The family history is entirely negative. She gets along well in school and is in the sixth grade. Menstrual onset has not yet appeared. The patient is rather poorly nourished, with a fair complexion. Her appearance is bright. Skin turgor is good. The scalp hair is dry and brittle and shorter over the occiput. There are no areas of patchy alopecia and no inflammation of the scalp. Eyebrows and eyelashes are normal in texture. There is no hair growth anywhere on the trunk or the extremities. Pupils are equal and react to light and in accommodation. Visual fields are roughly within normal limits. Eyegrounds are normal. The throat, ears, nose and neck are normal. The breasts are entirely flat. The heart, lungs, abdomen and extremities reveal no abnormality, and there are no neurologic abnormalities. The blood pressure is 115 systolic, 85 diastolic. The pulse is 80 and regular. The temperature is 98.8 F. The basal metabolic rate is +14. The blood count is within normal range and analysis of the urine gives negative results. A roentgenogram of the skull shows "moderate digitation over the inner table that would support clinical evidence of increased intracranial pressure. The sella turcica is normal in size and contour." I would appreciate any suggestions as to treatment or references.**

M.D., Illinois.

ANSWER.—This appears to be an unusual type of alopecia areata. The inquirer does not state what the appearance of the scalp was during the phases of loss of hair. One would want to know whether there was any inflammation present. It is not stated whether hairs, such as of the eyebrows and the eyelashes, participated in the process. It is not uncommon for the latter hairs to fall when all the scalp hairs are lost. Alopecia areata may recur after complete restoration of the hair, but its repetition three times a year for eight years is certainly extraordinary. It would be more usual for the process to be continued for years with new areas forming as old ones become covered with hair.

There is no new literature of significance pointing to either cause or cure of this disorder. The older theories that have been mentioned in the past continue to be invoked. They are the toxic, parasitic, trophic and endocrine theories.

Thallium is capable in proper dosage of effecting the loss of hair such as takes place in this case. Since thallium is incorporated in rat poisons, it may be worth while to inquire into the possibility of accidental thallium absorption. Foci of infection in teeth, tonsils or sinuses may be present. Jacquet stressed reflex irritation as a cause of alopecia areata. He mentioned especially defective teeth. Any source of irritation should therefore be sought for and eliminated. The basal metabolic rate is slightly above the upper limit for normal, which suggests that the test should be repeated. If the rate remains high in the second test, the administration of compound solution of iodine could be tried.

Syphilis is sometimes said to be a cause of alopecia areata. A blood serum test for syphilis should accordingly be made. If the periods of defluvium could be determined in advance, it might be helpful to use stimulating lotions on the scalp just prior to the expected event. A solution of mercury bichloride in the strength of 1:300 or 1:500 may be useful for this purpose. This application has a drying effect, and because this girl's hair is already dry and brittle castor oil should be added to the lotion. The periodic defluvia suggest as a possibility a peculiar form of erythema multiforme-like condition, which too tends to be periodic in its appearance. It might be well, then, to administer salicylates before an expected defluvium. Lastly, there are reports in the literature of shedding of the skin at regular intervals. This phenomenon is regarded as a form of atavism. This periodic loss of scalp hair may perhaps be likewise regarded. In such a case, nothing proposed would be expected to be of much benefit.

CHRONIC DIARRHEA AND PARATYPHOID BACILLI IN STOOLS

To the Editor:—**Could you suggest treatment for a chronic diarrhea of twelve years' duration? Stool cultures show paratyphoid A and B. The patient is passing some blood and is having from eight to twelve stools daily.**

M.D., New Mexico.

ANSWER.—It must be remembered that diarrhea is always a symptom and never a disease. The finding of paratyphoid bacilli in the stool culture only confuses the issue and means only that this patient is a paratyphoid carrier. Has the patient ever had clinical paratyphoid fever?

The common infectious causes of diarrhea of long standing are amebic dysentery, bacillary dysentery, ulcerative colitis, tuberculous enteritis and parasitic infestation. There are a number of noninfectious causes but relatively few of these would go undiagnosed for twelve years. Sprue must be considered. Pancreatic disease is a possibility. It is not likely that a patient with carcinoma of the bowel would survive for twelve years but with benign neoplasm might do so.

It seems hardly likely that pernicious anemia, leukemia, Addison's disease or one or two other causes would exist for twelve years without being recognized one way or another.

Since there is bleeding there is probably ulceration of the bowel. Proctoscopy to bring the ulcer under observation seems to be the first indication. It is possible that a diagnosis may be made from the appearance of the ulcer. Scrapings from the ulcer may be used for microscopic examination and culture. The proctoscopic examination would determine the advisability or need for x-ray examination of the bowel.

Only when a diagnosis is reached can suggestions for treatment be offered.

Nothing is said about the general condition of the patient. As a rule such patients are emaciated, dehydrated and anemic and show evidence of vitamin deficiency. All of these things must be treated while the fundamental cause is being determined.

ESTROGENIC THERAPY AND BLOOD CHOLESTEROL

To the Editor:—**A patient with menopausal symptoms is taking 0.12 mg. of estriol (Theelol) by mouth daily and 10,000 international units of estrone (Theelin) hypodermically twice a week. Blood cholesterol determination by the method of Bloor revealed 303 mg. per hundred cubic centimeters. It is my understanding that the estrogens are closely related chemically to cholesterol. Could the elevated cholesterol reading be accounted for by the estrongenic drugs she is taking? Unfortunately, no cholesterol determination was made before instituting this treatment. The basal metabolic rate before treatment was —25. Symptoms are so numerous and atypical that they cannot be interpreted as suggestive of a hypothyroid state.**

M.D., Alabama.

ANSWER.—Cholesterol is an essential constituent of all cells and fluids of the body. It belongs to the class of sterols, being chemically related to bile acids, calciferol, estrogen, androgen and progesterone.

The normal limits of blood cholesterol may vary from 120 to 200 mg. per hundred cubic centimeters. There are wide and rapid fluctuations even in the fasting state. Ingestion of fats, butter, eggs and meat increase blood cholesterol. It is said that 50 per cent of pregnant women show an increase in blood cholesterol in the latter half of pregnancy.

In myxedema and hypothyroidism the blood cholesterol ranges from 225 to 750 mg. per hundred cubic centimeters. The patient in question has a blood cholesterol level of 303 mg. Her basal

metabolic rate is —25 per cent, which could easily account for the increased cholesterol.

It is doubtful that the injection of estrogen had much influence on the moderately increased cholesterol in the case mentioned. It is more reasonable to suppose that the moderate hypothyroidism as shown by the basal metabolic rate had a more determining influence on this increase.

The dose of estrogen given to this woman seems large. It is advisable to give 2,000 international units of estrone three times weekly, plus thyroid to the tolerance limit. Larger doses of estrone may be given if this dosage does not produce satisfactory relief.

SCIATIC NERVE INJECTION

To the Editor:—**I have learned from German refugees that they use an ampule preparation of antipyrine, scopolamine and atropine for injection into the sciatic nerve in sciatica. Excellent results are claimed from two or three injections. Where can I obtain such material in the United States? What is the technic for sciatic nerve injection?**

Alexander Winter, M.D., New York.

ANSWER.—The injection treatment of sciatica is old. The technic of perineural injection in the buttock by the method of Lange of Leipzig (1904) was described by the late D'Orsay Hecht in THE JOURNAL, Feb. 6, 1909. A line is drawn from the junction of the sacrum and coccyx to the posterolateral external border of the greater trochanter. A stout needle is introduced at a point a thumb's width outside the junction of the inner and middle thirds of the line mentioned. The patient is asked to tell when the nerve is reached, as he gets a more or less painful sensation all the way to the heel. Today one generally first injects a little 1 or 2 per cent procaine hydrochloride followed by about 80 cc. of physiologic solution of sodium chloride.

Later Cathelin recommended epidural injection of procaine hydrochloride and physiologic solution of sodium chloride in the sacral foramen. The method was fully described by Israel Strauss in THE JOURNAL, Dec. 15, 1917. Following the procaine hydrochloride from 60 to 80 cc. of physiologic solution of sodium chloride is injected. By either method three injections two or three days apart are generally required. In 1922 Högler recommended injection of 10 cc. of 40 per cent warm antipyrine solution in the sacral canal. This method as well as injection of oxygen was described by J. P. Martin in the *Lancet*, May 22, 1926. It would not seem necessary to secure the German ampules mentioned, as a safe amount of scopolamine and atropine might be added to Högler's antipyrine solution.

DISCOID LUPUS ERYTHEMATOSUS

To the Editor:—**A girl aged 14 had a severe case of rhus poisoning three years ago. While the dermatitis on her hands soon disappeared, her face since that time has had many red oval patches covered with moderate slight scale formation. The patches are slightly elevated at their edges, somewhat depressed and atrophic appearing in their centers. There have never been any papules or vesicles in these patches. At present "patulous gland openings" are not readily discernible. There are all told nine patches on her face and three on her scalp, with loss of hair in these regions. The patches on both face and scalp have varied little in shape, size or appearance during the past three years in spite of many attempts at external therapy. The lesions do not itch, which suggested lupus erythematosus to me. These patches are sharply circumscribed. How effective is sodium gold thiosulfate in lupus erythematosus? Is external therapy of any value? The girl is in excellent health otherwise. The Kahn and Pirquet tests are negative.**

M.D., Illinois.

ANSWER.—The description fits discoid lupus erythematosus quite well. The peglike keratotic plugs may be discovered on the under side of the scales. The negative Pirquet reaction is an exception to the rule for lupus erythematosus but does not rule it out. The only other diagnosis likely would be that of sarcoid; but this seldom occurs at the age of 14. Before undertaking the treatment, however, it would be advisable to have the diagnosis confirmed by an experienced dermatologist.

Assuming a diagnosis of lupus erythematosus, the patient and her parents should be warned against exposure to strong sunlight or ultraviolet rays. The physician must watch also for the appearance of lesions on the upper part of the chest in the V exposed by the clothing to the action of light or on the fingers, hands or arms, for these are the signs of dissemination, indicating a much more dangerous form of the disease.

The urine must be examined frequently for albumin and casts, for kidney involvement is likewise a complication that adds much to the seriousness of the case. Frequent examinations of the blood are also necessary.

It is always difficult to know which method of local treatment may succeed in any given case. The internal administration of quinine in the maximum tolerated dose combined with external application of tincture of iodine to the lesions once a day is sometimes successful. A test dose of quinine should be given first, to rule out hypersensitiveness to the drug, and the signs of intolerance should be watched for during the treatment. Frequent rests from treatment are made necessary by the local reaction to iodine. Painting the lesions once a week with a mixture of 1 part of phenol and 4 parts of strong lactic acid may be valuable. The burning sensation does not last long and the local reaction is usually not excessive. In resistant cases, freezing with solid carbon dioxide at weekly intervals or less often, according to the strength of the reaction, is a valuable measure and if done with discretion does not make scars any greater than the lesions would leave under any method of treatment. From five to twenty seconds under fair pressure is usually enough. Radium applied superficially is also productive of good results in some cases. A mild reaction is usually necessary to obtain cure of the lesion, and the exact location must be recorded to protect against overdosage on this spot in case of recurrence. In this case also care must be exercised if carbon dioxide treatment is desired at a later date, for skin that has been subjected to the rays of radium or the x-rays may later be sensitive to freezing because of the damage to the blood vessels.

If all these methods of local treatment fail, it may be necessary to use general treatment. Intramuscular injections of bismuth salts may be carried out just as in the treatment of syphilis.

The treatment with salts of gold has become a standard method of management but there are many cases that will yield to milder measures, and gold therapy is not in any sense a minor form of treatment. It is comparable to the arsphenamine treatment of syphilis, and its toxic manifestations are somewhat more serious than those seen after arsphenamine. Leukopenia and sometimes granulocytopenia are of serious import and may be signalized by hemorrhages into the skin or from the mucous membranes. Cutaneous eruptions of various kinds, morbilliform, urticarial or scarlatiniform, may, if the treatment is not promptly stopped, progress to serious exfoliative dermatitis. The urine must be examined for albumin and casts before each dose, and the white blood cells should be counted every week or two. The physician has a double problem, a disease characterized by a tendency to sensitization and a drug which is noted for its sensitizing ability.

CARE OF ABDOMINAL COLOSTOMY

To the Editor:—**Judging from my own experience, there is a great paucity of information on how to care for a patient with an abdominal colostomy. I would like to know how to advise a patient what to do to alleviate a condition which usually makes the victim virtually a pariah. 1. What position should he take for evacuation, lying down prone, or should suction be employed? How about a pus basin? 2. What diet is recommended? 3. Is irrigation recommended at regular intervals? 4. If the opening is made through the rectus abdominis, may this act as a sphincter? What is the objection? 5. Pastes are used to seal the colostomy pad. What is aluminum paste? 6. What can be done about loose stools, flatus, fecal odor and the like? 7. Is there a good colostomy pad on the market?**

Thomas I. O'Drain, M.D., Philadelphia.

ANSWER.—A patient with an abdominal colostomy is not ordinarily in any way interfered with in the performance of his ordinary social or business duties. All that is required is a little attention to a system, in which even the patient is able to carry on as well as anybody.

1. The patient is usually advised to take an enema of three glasses of water every morning, lying on the back end of the bathtub. A catheter inserted into the colostomy is threaded through an ordinary baby's nipple, the sucking end of which is inserted into the colostomy and acts as a water valve. After the three glasses of water has been taken the patient sits up, places a basin beneath the colostomy, gently massages the abdomen and thoroughly evacuates the large bowel.

2. The patient is advised to abstain from laxative food for the first few months after operation, taking only enough fruit and vegetables and cooked fruit to insure reasonably easy movements. It is not well for the patient to have diarrhea. After about six months the patient is usually able to eat a general diet.

3. Irrigation is advocated every morning after breakfast, the average time for its completion being about one-half hour.

4. Opening of a colostomy is possible through the rectus muscle, but this does not act as a sphincter. There is no objection to bringing it through the rectus muscle. The only criterion of its position is to get it away from the umbilicus and the anterior superior spine.

5. A paste does not need to be used to seal the colostomy. The aluminum paste is used in ileostomies and consists of a mixture of aluminum powder with wool fat. Aluminum powder alone is often dusted around the ileostomy.

6. Loose stools can be controlled by a decrease of fruit and vegetables and the administration of some powders consisting of

15 grains (1 Gm.) of calcium and bismuth subcarbonate. If there is too much flatus, the patient's diet should be somewhat restricted in carbohydrates. Fecal odor is not present if the enema is carried out properly, because there is no discharge from the bowel for twenty-four hours after it has been once been emptied.

7. Colostomy cups are difficult to keep clean and free from odor. The patient may be advised to surround the colostomy with a circle of petrolatum gauze, to put a gauze pad over this and then pull up over his abdomen a cheap elastic belt which can be laundered. This combination is effective and hygienic.

UTERINE BLEEDING

To the Editor:—A white woman, unmarried, aged 24, 5 feet 8 inches (173 cm.) tall, weighing 135 pounds (61.2 Kg.), had uterine bleeding daily in varying amounts for four years. The onset of this bleeding occurred following her mother's death. The patient believes that she suffered some nervous shock as the result. During the four years she has had a variety of glandular treatments, mainly injectable materials. Several capable gynecologists have treated the patient for periods of six months or more during her illness. At no time have there been cramps or severe hemorrhage. She has been entirely unable to determine periods. There has been no loss of weight nor any other apparent physical disability. Physical examination has revealed nothing unusual. Pelvic examination is apparently negative. Treatment previous to my seeing the patient has included a dilation and curettement without results. Even radium insertions were tried without success. Since she has been under my care whole ovarian substance, gonadogen (Upjohn) and corpus luteum have been used without success. This patient has become discouraged to the point that she desires a hysterectomy. Can you suggest some way of preventing this catastrophe? Alfred Breuer, M.D., Cleveland.

ANSWER.—Before hysterectomy is resorted to, two medicaments should be tried. The first is thyroid. One or more basal metabolism studies should be made to rule out hyperthyroidism before thyroid therapy is begun. At least one month's trial with thyroid should be given. One grain (0.065 Gm.) should be taken daily for a week and if untoward symptoms do not arise, 2 grains (0.13 Gm.) should be taken daily. If this treatment does not check the bleeding, the male hormone testosterone propionate may be administered. This patient may be given relatively large doses; 25 mg. of testosterone propionate may be given hypodermically three times a week for four weeks. If the bleeding stops, further medication need not be given unless the irregular bleeding returns. If the bleeding continues in spite of the twelve injections, from six to twelve more injections may be administered, the same dosage being given. When more than 450 mg. of testosterone propionate is given there is some likelihood that signs of virilism will appear. These are growth of hair on the face, lowering of the pitch of the voice and slight enlargement of the clitoris. There is also the strong possibility of a gain in weight and the development of an acneform eruption. However, all these signs disappear after the medication is stopped.

Since testosterone proprionate therapy is usually of temporary benefit, the administration of this hormone will most likely have to be repeated from time to time. However, in some cases, for some as yet unexplained reason, normal menstruation often returns after this form of therapy.

GONORRHEAL SALPINGITIS

To the Editor:—A married woman aged 21 has had gonorrheal salpingitis for the past nine months. Two other physicians besides myself have advised removal. She and her parents, who are intelligent, are much opposed to any operation. I am therefore writing for advice as to whether there is any treatment which will offer her a cure without the operation. The patient is in fairly good general condition, only slightly anemic and undernourished. Pelvic examination reveals involvement of both tubes, but it has not extended beyond as far as can be determined. An osteopath has guaranteed a cure by giving her electrical treatments of some type. Unless we can offer her some hope of a cure without an operation she will undoubtedly take these treatments.

G. H. Moranville, M.D., Winton, Wyo.

ANSWER.—Eighty-five per cent of patients who suffer from a first attack of gonorrheal salpingitis progress to clinical recovery without recourse to operation. The first measure of importance is to make certain that the patient is not exposed to reinfection, for recurrent infections are more stubbornly resistant to treatment. All sex life should be avoided during the active stage; later indulgence should be limited, and always with condom protection. Rest in bed, care of the bowels, control of pain with codeine and employment of Priessnitz dressings if discomfort is great will usually result in ultimate recovery. Elliott treatments are helpful after the most acute stage, but they are not the cure-all which many have assumed. Sulfanilamide medication is not to be depended on implicitly, yet it is often successful and should be given a trial in all severe cases.

MILROY'S DISEASE

To the Editor:—Two sisters, aged 31 and 36 respectively, have Milroy's disease. Their symptoms began several years ago, at which time they developed painless swelling of both lower extremities. The edema is of the pitting type and extends up to the knees. The older of the two now has swelling of both legs resembling elephantiasis, but no other symptoms. The basal metabolism is normal and results of blood and kidney studies are normal. The younger sister has developed erythematous plaques at the flexor surfaces of both elbows, knees and thighs. She also complains of pains between the shoulder blades. Any information regarding the treatment of this condition will be appreciated.

P. E. Schwartz, M.D., Portland, Conn.

ANSWER.—There is no treatment that will accomplish a cure in Milroy's disease. Various surgical procedures, administration of thyroid and other endocrine substances, and diets have all been tried and have failed. It has been found that rest in bed will decrease the edema and that mechanical relief may be obtained by the application of tight bandages to the lower extremities. Such bandages have been worn for many years by patients with this disease. The condition is not incompatible with long life and good health apart from the mechanical discomfort and the unesthetic appearance.

It seems unlikely that the pain described in this case is a direct result of the disease. Occasionally the skin undergoes changes due to pressure and stretching. Such changes must be treated symptomatically.

GENTIAN VIOLET AND BORIC ACID OINTMENT FOR BURNS

To the Editor:—Will you please supply information on the use of boric acid ointment after aqueous gentian violet has been used in the treatment of burns. It has been brought to my attention that these two preparations are incompatible. If so, please give reasons.

R. W. Bourke, M.D., East Walpole, Mass.

ANSWER.—Gentian violet is usually used relatively soon after the patient has suffered a burn. It becomes fixed by the tissues and forms a superficial crust. After the removal or separation of this crust various substances are used depending on the condition of the tissues underneath the crust. This condition is dependent, of course, on the depth of the burn. Boric acid ointment, if it is used, would be applied after such separation has occurred or after fixation of the genitan violet by the tissues. Even were it to be used early, that is, soon after the gentian violet has been applied, chemical incompatibility which would have a detrimental effect has not been determined.

ALMOND OIL

To the Editor:—Is there any known medical use for sweet almond oil? Can it be safely used as a laxative? If so, in what dosage? The almond is one of the oldest nuts known to man and has been cultivated for thousands of years. Is there any evidence that it was used for medical purposes in ancient times? Some of my friends claim that they have found the almond, and almond oil, of value in arthritis. Is there any basis to their claims? Would its high vitamin and protein content make it of value in preparation of candy for children? M.D., California.

ANSWER.—Sweet almond oil possesses the emollient properties of the other fixed oils so that it could be used to soften chapped hands and for other inflamed conditions of the skin. It is also useful for the emulsification of volatile oils, as a base. There is little or nothing on which to base a claim of efficacy in cases of arthritis. The oil can be used as a safe laxative in doses of from 4 to 8 cc. The nut should be good for making candy but would be no better than other nuts.

DUODENAL INSUFFLATION OF OXYGEN FOR INTESTINAL DISTENTION IN PNEUMONIA

To the Editor:—Have high concentrations of oxygen instilled directly into the duodenum through a Levine tube ever been used as a method of treatment of patients with pneumonia complicated by a marked distention which has failed to respond to the ordinary methods of treatment of distention, such as stupes, enemas, rectal tube, medication and the like? Would you give me references to any articles on this subject?

Bernard E. Cohler, M.D., Chicago.

ANSWER.—No one seems to have proposed duodenal insufflation of oxygen in the treatment of intestinal distention in pneumonia. This might be a dangerous procedure. Distentions in pneumonia should be classified as those involving the left upper quadrant of the abdomen or stomach and those involving the intestine and colon. The former are relieved by aspiration through a Levine tube or by Wangensteen's suction device. In the intestine they are usually an expression of profound poisoning and are frequently associated with bacteremia. Unless the infection is overcome they are ultimately uncontrollable.

Jacob Fine and his co-workers, who introduced the oxygen inhalation therapy of postoperative distentions, have shown, in several valuable contributions, the mechanism by which this is accomplished (Fine, Jacob; Frehling, Stanley, and Starr, Arnold: Experimental Observations on the Effect of 95 Per Cent Oxygen on the Absorption of Air from the Body Tissues, *J. Thoracic Surg.* **4**:635 [Aug.] 1935. Fine, Jacob; Banks, B. M., and Hermanson, Louis: The Treatment of Gaseous Distention of the Intestine by the Inhalation of 95 Per Cent Oxygen, *Ann. Surg.* **103**:375 [March] 1936. Fine, Jacob; Sears, J. B., and Banks, B. M.: The Effect of Oxygen Inhalation on Gaseous Distention of the Stomach and the Small Intestine, *Am. J. Digest. Dis. & Nutrition* **2**:361 [Aug.] 1935). Inhalation oxygen therapy in pneumonia, which increases the oxygen in the respiratory and gastrointestinal tracts, lessens the incidence of distention. With the prompt and efficient use of chemotherapy and serum therapy abdominal distention is encountered much less frequently than formerly.

SEROLOGICALLY NEGATIVE SYPHILIS AND PREGNANCY

To the Editor:—**A woman aged 28 states that she and her husband were treated for syphilis in 1933. They received only about four months of treatment and were discharged. In 1938 the husband's Wassermann reaction was four plus and I gave him two years of continuous treatment, after which it was still four plus and I considered him Wassermann fast. The wife's blood and spinal fluid have been negative on six examinations at intervals of two months. At present the woman is about eleven weeks pregnant; Wassermann, Kahn and Kline reactions are negative; the husband was considered Wassermann fast seven months ago—should I give her any treatment? I did not obtain a positive blood test on her and complete physical examination is essentially negative.**

M.D., Missouri.

ANSWER.—Comment is not made in regard to the status of the husband's spinal fluid. It seems unwise to consider him Wassermann fast without knowing the status of the spinal fluid. The fact that the wife's serologic reactions have been repeatedly negative during the past year is not sufficient evidence to discard the need for treatment if she is now in the early phase of pregnancy. Studies have shown slightly less than 20 per cent of women with latent syphilis and who have a negative serologic reaction develop complications as a result of the syphilis during a pregnancy. In other words, it appears advisable to urge this woman to undergo a course of treatment as a means of doing all within her power to have a normal child.

RED CELL VOLUME MEASUREMENTS

To the Editor:—**I desire to do red cell volume measurements using either the Sanford and Magath centrifuge tube or the Wintrobe hematocrit tube. If the Wintrobe tube is satisfactory for the combined determination of the sedimentation of velocity and the volumes of the packed red cells I should prefer the Wintrobe tube. Will you advise me whether the Wintrobe tube is sufficiently rugged so there is little or no breakage in the centrifuge? Are the cell volumes as determined by this tube considered accurate? How many times gravity must the centrifugal force be in order to secure reliable volumes in from thirty to sixty minutes' centrifuging time? What is the lowest priced centrifuge which would give satisfactory determination (with an alternating electric current of 110 volts)? Would you advise me also as to the dealer from whom such a centrifuge may be obtained? The equipment is wanted for a small laboratory where the volume of work is not heavy. It is proposed to use this centrifuge only for the red cell volume determination.**

Thomas P. Haslam, M.D., Council Grove, Kan.

ANSWER.—Accurate red cell volume measurements are obtained with both Sanford-Magath and Wintrobe hematocrit tubes. The cell volume varies slightly with the anticoagulant, the centrifugal force and the time of centrifugation. An isotonic anticoagulant (1 cc. of a 1.4 per cent sodium oxalate solution to 5 cc. of blood) is employed with the Sanford-Magath tube. The small Wintrobe tube requires a dry anticoagulant. If heparin or a dry oxalate mixture is used, the readings with the Wintrobe and the Sanford-Magath tubes are the same. The dry anticoagulant is made as follows: Three Gm. of ammonium oxalate and 2 Gm. of potassium oxalate are dissolved in 100 cc. of distilled water; 0.08 cc. of this solution is run into a test tube and dried completely. Exactly 2 cc. of blood is added and mixed. The Wintrobe tube is filled with this oxalated blood. The cells shrink if potassium oxalate only is used, so the reading is multiplied by 1.08. The Wintrobe tube can be used for the sedimentation rate also and is quite rugged.

Any centrifuge is satisfactory if properly calibrated. The small clinical centrifuges obtainable from any laboratory supply house for about $35 give good results. The blood is usually spun at 3,000 revolutions per minute for from thirty to sixty minutes.

The best procedure is for each laboratory to determine the mean cell volume in normal persons with the technic employed. To find this, determinations on ten obviously normal individuals are done and the normal mean is calculated. The reading for any abnormal blood is compared with this normal value.

INCISIONAL HERNIA

To the Editor:—**A patient was operated on in 1924 for appendicitis through a right rectus incision. Recently the patient noticed a small swelling in the scar while straining at stool. There was no pain at the time and the only occasion that the patient can remember having a definite pain in the scar was six months previously when there was moderate pain for a few minutes while lifting a weight of about 75 pounds. Is it probable that breaking of the scar occurred six months previous to the appearance of the hernia or that it occurred without any pain a few days before being noticed?**

G. E. Perkins, M.D., Norton, Va.

ANSWER.—Usually an incisional hernia develops gradually as the result of the many different traumas from strain and exercise in daily activity. It is gradually enlarged. It is not improbable that one heavy lift six months previous to its being noticed has been a stronger factor than the other traumas, but it would be difficult to prove this, perhaps impossible.

CYSTINE-RICH PROTEINS IN TISSUES

To the Editor:—**Kindly advise me what polymeric polysulfides are found in the human body.**

G. W. Tyrrell, M.D., Perth Amboy, N. J.

ANSWER.—There are no "polymeric polysulfides" found in the human body in the strict sense of the term. The substances which might possibly be classified as near to "polymeric polysulfides" are those proteins which are rich in cystine. Cystine is a disulfide and proteins contain various amounts of cystine. Hair, skin, finger nails and toe nails are particularly rich in cystine as compared with other tissues.

TONSILLECTOMIES IN DIONNE QUINTUPLETS

To the Editor:—**The query regarding the justification of tonsillectomies in the Dionne children (The Journal, August 10, p. 476) emphasizes a practice which seems to me overdone. Under the circumstances described, Dr. Dafoe could hardly have proceeded otherwise than he did. Repeated attacks of acute tonsillitis and swelling of the cervical lymph nodes seem to be the only important indications for tonsillectomy. The opinion of the consultant that there "is palpable evidence that the infection from their tonsils is spreading and at any time may get into the whole system, producing disastrous results . . ." is hypothetical. Such unguarded statements of direct responsibility for dire consequences "unless their tonsils and adenoids are removed at once" have no doubt been responsible for what is called "wholesale tonsillectomy" by the New York physician who questioned the procedure. The quintuplets are at the age when "normal" hypertrophy of lymphoid tissue is present, so that "very large" tonsils or the fact that they "nearly touch each other" may not be abnormal. Many studies referred to in recent papers by Dr. Havens and myself (Focal Infection and Systemic Disease: A Critical Appraisal, The Journal, Jan. 6, 1940, p. 1; Infectious Diseases: Review of Significant Studies in 1939-1940, *Arch. Int. Med.*, August 1940) support our opinion that tonsillectomy performed in children for such supposed dangers is not justified and that large numbers of persons who have tonsils are no worse off than similar groups who have not. Although no figures are available, it would also seem that the risk of serious complications resulting from the operation itself is about as great as the probabilities mentioned in the consultant's opinion.**

Hobart A. Reimann, M.D., Philadelphia.

REACTIONS TO SACRAL ANESTHESIA

To the Editor:—**In the Journal for July 27, page 322, there appears an inquiry concerning "reactions to sacral anesthesia and pernicious anemia." The interrogator stated that "sacral anesthesia" was performed in the case in question. The reply is based on the presumption that spinal anesthesia had been performed. The term "sacral anesthesia," as conventionally used, certainly does not apply to the method of subarachnoid injection. It implies the use of technics for producing regional anesthesia by any one of the various extradural approaches, such as transsacral, presacral or caudal methods. Presumably it was by some extradural method that the interrogator produced anesthesia in the case in question, and it was to learn whether such an anesthetic procedure is capable of causing degeneration of the spinal cord that he made his inquiry. The reply to the inquiry failed to give any information regarding the significant point involved, the incidence of subarachnoid lesions due to extradural injections of anesthetic agents, and furthermore it seems an inadequate statement as to the incidence of neurologic sequels of spinal anesthesia. Is it possible to say without qualification, for example, that any administration of spinal anesthesia "may be followed by . . . degenerative lesions of the spinal cord"? Such a statement fails to discriminate between the toxic or traumatic factors which are present in certain particular instances and the inherent factors of subarachnoid anesthesia itself. In illustration, it would not be fair to state that "any administration of nitrous oxide may be followed by degenerative lesions of the cortex," since such lesions occur as sequels of the misuse rather than the correct use of the agent under discussion.**

Alden W. Squires, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, September 7, page 880.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 17-19. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: * *Written.* Phoenix, Oct. 1. *Reciprocity.* Phoenix, Oct. 2. Sec., Dr. J. H. Patterson, 326 Security Bldg., Phoenix.

ARKANSAS: * *Regular.* Little Rock, Nov. 7-8. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Oct. 2. *Written examination.* Sacramento, Oct. 21-24. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * Denver, Oct. 1-4. Applications must be on file not later than Sept. 17. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: * *Written.* Hartford, Nov. 12-13. *Endorsement.* Hartford, Nov. 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* Derby, Nov. 12-13. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, Nov. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: * Tampa, Nov. 18-19. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, Oct. 8-9. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Jan. 8-11. Sec., Dr. James A. Morgan, 48 Young Building, Honolulu.

IDAHO: Boise, Oct. 1. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 1-3. Superintendent of Registration, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 17-19. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, Citizens Trust Building, Fort Wayne.

KANSAS: Topeka, Dec. 10-11. Sec., Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 3-5. Sec., State Board of Health, Dr. A. T. McCormack, 620 Third St., Louisville.

MAINE: Portland, Nov. 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 10-13. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 10-11. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 12-14. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: * Lansing, Oct. 9-11. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Oct. 15-17. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity.* Helena, Sept. 30. *Written.* Helena, Oct. 1-2. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEVADA: Reciprocity with oral examination, Nov. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, Oct. 15-16. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 7-8. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 23-26. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

NORTH CAROLINA: *Reciprocity.* Durham, Dec. 3. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 7-10. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: * Oklahoma City, Dec. 11. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: * *Reciprocity.* Portland, October. *Written.* Portland, Jan. 14-16. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, 358 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Oct. 3-4. Sec., Division of Examination, Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 12. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 21-22. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: Austin, Nov. 25-27. Sec., Dr. T. J. Crowe, 918-920 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 11. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 4-6. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Morgantown, Oct. 31-Nov. 2. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: * Madison, Jan. 14-17. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, October. Sec., Dr. M. C. Keith, Capitol Building, Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 17. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, Sept. 16-17. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: New Haven, Oct. 12. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 21-22, Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Gainesville, Nov. 1. Applications must be on file not later than Sept. 16. Sec., Dr. John F. Conn, John B. Stetson University, De Land.

IOWA: Des Moines, Oct. 8. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Building, Des Moines.

MINNESOTA: Minneapolis, Oct. 1-2. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 1-2. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Oct. 26. Sec., Mr. Charles D. Bryne, State Board of Higher Education, University of Oregon, Eugene.

SOUTH DAKOTA: *Examination.* Yankton, Dec. 6-7. *Endorsement.* Dec. 21. Sec., Dr. Gregg M. Evans, Yankton.

WISCONSIN: Madison, Sept. 21. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Arkansas June Report

Dr. D. L. Owens, secretary, State Medical Board of the Arkansas Medical Society, reports the written examination held for medical licensure at Little Rock, June 6-7, 1940. The examination covered twelve subjects. An average of 75 per cent was required to pass. Fifty-eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1940)	85, 85, 85, 86, 86, 86, 86, 87, 87, 87, 87, 87, 87, 87, 87, 88, 88, 88, 88, 88, 89, 89, 89, 89, 89, 89, 89, 89, 89, 90, 90, 90, 90, 90, 90, 90, 90, 90, 91, 91, 91, 92, 92, 92, 92, 92, 92, 92, 93, 93, 93, 93, 93, 93, 94, 95, 96
Louisiana State University School of Medicine		(1940)	92*

Eleven physicians were licensed to practice medicine by reciprocity and one physician so licensed by endorsement from January 13 through June 10. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Graduate School of Medicine of the University of Alabama		(1915)	Tennessee
Northwestern University Medical School		(1935)	Illinois
Tulane University of Louisiana School of Medicine		(1938)	Tennessee
Johns Hopkins University School of Medicine		(1931)	California
University of Maryland School of Medicine and College of Physicians and Surgeons		(1934)	Maryland
University of Minnesota Medical School		(1935)	Minnesota
University of Oklahoma School of Medicine		(1938)	Oklahoma
University of Pennsylvania School of Medicine		(1927)	Maryland
University of Tennessee College of Medicine		(1937) (1938)	Mississippi. Tennessee
University of Virginia Department of Medicine		(1935)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Tufts College Medical School		(1926)	N. B. M. Ex.

* License has not been issued.

North Dakota July Report

Dr. G. M. Williamson, secretary, North Dakota State Board of Medical Examiners, reports the written examination for medical licensure held at Grand Forks, July 2-5, 1940. The examination covered thirteen subjects and included 100 questions. An average of 75 per cent was required to pass. Sixteen candidates were examined, all of whom passed. Five physicians were licensed to practice medicine by reciprocity and four physicians so licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists		(1940)	1
Loyola University School of Medicine		(1938)	1
Rush Medical College		(1937), (1938), (1939, 2)	4
Louisiana State University School of Medicine		(1940)	1
University of Minnesota Medical School		(1937), (1940, 4)	5
University of Oregon Medical School		(1937)	1
Hahnemann Medical College and Hosp. of Philadelphia		(1939)	1
Temple University School of Medicine		(1939)	1
Marquette University School of Medicine		(1940)	1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1935)	Arkansas
State University of Iowa College of Medicine		(1935)	Iowa
University of Louisville School of Medicine		(1937)	Kentucky
University of Minnesota Medical School		(1936)	S. Dakota
University of Virginia Department of Medicine		(1938)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1938)	N. B. M. Ex.
Boston University School of Medicine		(1937)	N. B. M. Ex.
University of Minnesota Medical School		(1935)	N. B. M. Ex.
Woman's Medical College of Pennsylvania		(1929)	N. B. M. Ex.

Book Notices

The Soldier's Heart and the Effort Syndrome. By Sir Thomas Lewis, C.B.E., F.R.S., M.D., Physician University College Hospital, London. Second edition. Cloth. Price, 8s. 6d. Pp. 103. London: Shaw & Sons, Ltd., 1940.

This book was published shortly before the close of the war of 1914-1918. In his introduction to the present edition the author states that "the magnitude of the problems presented by this condition from the standpoint of army wastage, invalidism and pensioning will be realized when it is known that not less than 70,000 soldiers had reported sick and were classed as cardiovascular by the summer of 1918; and 44,000 cases of 'effort syndrome' became pensioners. Actually no more than one out of six of these soldiers suffered from disease of the heart. The rest were effort syndrome cases. The problem is the same in this war as in the last; and if this war continues as the last did, it will not be of much less magnitude than it was in that." Lewis proposed the term "effort syndrome" to replace that of "disturbed action of the heart." The new term was to be used to express a group of symptoms and signs which resemble those of physiologic fatigue following exercise in the absence of a definite disease of the heart, lungs or thyroid. The etiology of the effort syndrome, or neurocirculatory asthenia, as physicians in the United States prefer to call it, has never been clearly elucidated. In discussing the contributing etiologic factors he mentions that 57 per cent of the soldiers invalided for this cause were recruited from sedentary or light occupations. Many of these men showed defective physical development and frequently a defective nervous organization. Among the exciting factors Lewis stresses those of strains of training and service. It appears that infection is an important element. Among the British soldiers rheumatic fever was of the greatest importance. Other infections were pneumonia, pleurisy, influenza, bronchitis and dysentery. Infectious diseases, the author estimates, have played a chief part in promoting the syndrome in at least 50 to 60 per cent of the cases. Lewis dismisses the question of "heart strain" by stating "neither in civilian nor in military practice have I seen a patient in whom the evidence for heart strain as a primary cause of breathlessness could be regarded at all convincing." Few soldiers dated the first onset of symptoms to an unustial strain. Such a history was obtained in only five of 558 cases. X-ray studies showed the heart to be on the average smaller than normal. Tobacco, alcohol and venereal diseases played an insignificant part in the causation of the effort syndrome. The most important problem confronting the medical personnel in sorting cardiovascular cases is to differentiate effort syndrome from organic heart disease. Cardiologists will be particularly interested in the chapter on diagnosis of disease of the heart in soldiers. In the author's experience murmurs are to be heard over the precordium in more than half of the soldiers sent to military hospitals for actual or supposed cardiac disorders. The most frequent of these is the cardiorespiratory murmur, which is really a breath sound accompanying a cardiac systole. It is usually associated with a rapid heart action and has no diagnostic or prognostic significance. The author also warns against attaching significance to the pulmonary systolic murmur heard over the second or third left cartilages. On the other hand a palpable thrill and cyanosis suggest the probability of pulmonary stenosis or patent ductus arteriosus. Aortic systolic murmur is of no significance. Diagnosis of mitral regurgitation is justified in the presence of a systolic murmur and a history of rheumatic fever. Rheumatic fever and chorea were responsible for 54 per cent of cases of aortic regurgitation and of 65 per cent of mitral stenosis. There is a valuable chapter on examination of recruits and on medical reports on discharged soldiers.

The author apparently does not regard this interesting syndrome as a primary cardiac condition. He feels that abnormal anxiety must be regarded as a real and important contributing cause. In discussing the treatment he emphasizes that understanding of the relations between nervous states and effort syndrome is essential to successful treatment and deserves further and careful study. The most important contribution by the author to this subject is the method of treating these soldiers by graded exercises. These consist of drills or games so graded that no man is submitted to severe exercises before his tolerance is thoroughly established. The method is useful for both sorting trained soldiers for work or duty and as specific therapy. Under this method of treatment the hospital stay of patients was reduced from the average of 5.3 months to five or six weeks. The enormous experience of Sir Thomas Lewis in the past war together with his background as a noted cardiologist adds particular importance to this monograph.

Artificial Pneumothorax: Its Practical Application in the Treatment of Pulmonary Tuberculosis. Contributions by Saranac Lake Physicians to the Studies of the Trudeau Foundation. Editorial Committee: Edward N. Packard, M.D., John N. Hayes, M.D., and Sidney F. Blanchet, M.D. Foreword by E. R. Baldwin, M.D. Cloth. Price, $4. Pp. 300, with 85 illustrations. Philadelphia: Lea & Febiger, 1940.

Those interested in collapse therapy are fortunate in having such a logical statement of the broad principles underlying the employment of artificial pneumothorax in the treatment of pulmonary tuberculosis. The historical background is brief but clearly descriptive of what has gone before, and the facts presented serve as a base line from which the operation may intelligently proceed with the assurance of past results.

The chapter on physiology is well presented and supplies the fundamental physiologic phenomena which should be understood by every one who practices or contemplates the practice of pneumothorax. In the chapter on selection of cases, indications and contraindications are briefly but clearly presented. The authors obviously recognize the danger of drawing hard and fast lines with dogmatic recommendations. They frankly state that experience on the part of the operator serves as a valuable supplement to any proposed criteria for the selection of cases. On the whole, this chapter may be accepted as a valuable aid to the experienced operator and a safe guide for the novice. That part of the chapter dealing with nontuberculous disease is logical and conservative, cautiously safeguarding the inexperienced and leaving the experienced operator an open road for careful trial in questionable cases. A more detailed discussion of pneumothorax in ambulatory cases would have been helpful to those who are trying to solve this question. The chapter devoted to the value of the x-rays in artificial pneumothorax should be carefully studied, in that the x-ray observations should be closely linked with the symptoms and signs before decisions are reached and should serve as a guide subsequent to the induction of pneumothorax. Such a study materially aids in the classification and selection of cases. After pneumothorax is induced, the continued use of the x-rays is valuable in determining the results and directing the course of treatment. New developments in the contralateral lung may be observed and complications such as adhesions, pleural effusions, empyema, mediastinal hernia and spontaneous pneumothorax recognized. The importance of the x-rays in artificial pneumothorax is well shown and perhaps the closing statement is warranted: "The x-ray is not the handmaiden but the mistress of therapeutic pneumothorax." The chapter on apparatus will serve as a valuable guide to those who contemplate the use of pneumothorax as a therapeutic measure. The same may be said of the chapter on technic. The authors are to be commended for pointing out the fact that the technic may be perfectly safe while remaining relatively simple. The chapter on accidents during operation offers a brief but ample discussion of the possible accidents, including the troublesome question of gas embolism and pleural shock. The means of recognition and methods of treatment are well presented. A careful study of the remaining chapters reveals the same concise but brief treatment of the various phases of this valuable therapeutic procedure, including the many additional problems arising in the course of its application. The subjects of the remaining chapters are physical signs in artificial pneumothorax, conduct of treatment, pleural complications of artificial pneumothorax, results of treatment of tuberculous empyema, the opposite lung in artificial pneumothorax, bilateral artificial pneumothorax, artificial pneumothorax and the heart, the duration and termination of treatment, the pathology of the tuberculous lung treated by artificial pneumothorax, oleothorax, thoracic surgery in relation to artificial pneumothorax, and results of treatment by artificial pneumothorax.

This work is recommended by its source, and a thorough study of its contents warrants the conclusion that the authors

have sustained the high quality which characterizes the other publications coming from the Saranac group. This publication constitutes a valuable handbook on artificial pneumothorax and it is doubtful whether so much information in concise form is to be found in any other publication.

The Vitamin B_1 Content of Foods in Terms of Crystalline Thiamin. By Lela E. Booher, Senior Nutrition Chemist, and Eva R. Hartzler, Junior Chemist, Foods and Nutrition Division, Bureau of Home Economics. United States Department of Agriculture Technical Bulletin No. 707. Paper. Price, 5 cents. Pp. 20. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

This valuable bulletin gives the vitamin B_1 content of some 100 foods commonly included in the American dietary in terms of international units and micrograms per hundred grams of food (edible portion). This compilation of data is especially useful since the vitamin B_1 content of foods reported in the earlier literature was often expressed in units not always convertible to international units. The daily requirement of a normal adult for vatimin B_1 is considered to be about 400 international units. From this bulletin one can learn which foods are excellent, good, fair or poor sources of vitamin B_1 and select a diet accordingly. Foods listed in the class "excellent" providing no less than 150 international units of vitamin B_1 per hundred grams are dried lima beans, cow peas, rolled oats, peanuts, pork chop (lean portion), smoked ham and soybeans. Foods listed in the class "good," providing from 100 to 150 international units of vitamin B_1 per hundred grams, are fresh lima beans, dried navy beans, egg yolk, dried milk, peas, walnuts and whole wheat. Foods listed in the class "fair," providing from 30 to 100 international units of vitamin B_1 per hundred grams, are asparagus, beef (the lean portion), broccoli, brussels sprouts, cauliflower, chicken (dark meat), corn meal (yellow), corn (sweet), kale, lamb (lean portion), liver, mustard greens, okra, peanuts (roasted), pineapple, potatoes, prunes (dried), spinach, sweet potatoes, turnip greens and wheat (shredded).

Fortschritte der Allergielehre (Forschung und Klinik). Unter Mitwirkung von G. Dahlberg et al. Herausgegeben von P. Kallós. Cloth. Price, $10. Pp. 400, with 38 illustrations. New York: Nordemann Publishing Company, Inc.; Basel: S. Karger, 1939.

Although the attempt to summarize the recent advances of allergy and immunology in all the fields of medicine is a commendable endeavor, this work is somewhat confusing, owing to the fact that each chapter is written by a different person. Many of the chapters conform to the philosophic flights of fancy one has learned to expect of German "armchair" scientists. The chapter by Haurowitz is excellent and summarizes all the recent work on antigens, antibodies and antigen-antibody reactions. It is worth the price of the book to one interested in this field. Harley's method of treating hay fever may be applicable to conditions in England but would be a failure if adapted to the treatment of ragweed pollinosis as it occurs in the United States. Lowenstein's chapter on allergic diseases in ophthalmology is good. The book is full of the names of foreign proprietaries, the use of which the authors advise. It is much too difficult to remember these names and the reviewer, for one, prefers to use simple pharmacopeial preparations. We cannot agree with Unditz (who authored the chapter on "Pharmakotherapie") that calcium is practically the cure-all for allergic diseases. One thing that this book illustrates is that allergy has involved every branch of medicine and has succeeded in explaining many previously unclear and perplexing phenomena.

Family Allowances: Children Must Be Fed. Paper. Price, 3d. Pp. 32, with illustrations. Aylesbury, Buckinghamshire: Lancet, 1940.

The fact that "in England today there are children going so short of proper food that their health and growth are being damaged" leads the London *Lancet* to believe that a medical problem is created. Wages are paid on the theory that a man is entitled to "at least a 'living wage'" to cover a "normal family" with three children. But only 3.9 per cent of men have more than three children and these are responsible for 23 per cent of the children. The present so-called living wage does not afford adequate food for a family of even five and is very inadequate for additional children. Since the first item of economy in the family budget is usually food, a large amount of malnutrition results which affects not only the children but even more frequently the mother and is reflected in a high maternal death rate. The *Lancet* therefore urges a family allowance based on the number of children in the family. Tentative movements in Great Britain and in France, Belgium, Germany, New South Wales and New Zealand provide allowances for the support of children. Three ways of paying such allowances universally have been tried; the whole burden may be put on the employers or on taxation or through a contributory scheme in which employers, workers and the state share. So far from believing that a state of war is an objection to undertaking such a plan, it is urged that "now is the time to prevent the onset of widespread poverty, with all the nutritional disasters which it creates."

Practical Food Inspection. By C. R. A. Martin, M.R.San.I., Chief Sanitary Inspector, Whitstable. In Two Volumes. Volume I: Meat Inspection. Volume II: Fish, Poultry and Other Foods. Second edition. Cloth. Price, 15s.; 12s. 6d. Pp. 316, with 138 illustrations by the author; 275, with 58 illustrations by the author. London: H. K. Lewis & Co., Ltd., 1940.

These two volumes are by a practical inspector who makes excellent use of "data collected during routine inspectorial work extending over a period of many years." The first edition (November 1932) was apparently well received and made this revision with the introduction of new material necessary. This work contains information valuable not only to the inspector with scientific training but also to those without that background, as it does not include highly technical details. The first volume, on meat inspection, is thorough and well done. It does not attempt comprehensive coverage of physiology or anatomy, and the material on antemortem inspection is limited but all the information given is of fundamental importance. The suggestions as to a system of meat inspection could well be carefully considered for adaptation to intrastate meat by state and municipal officials to supplement federal meat inspection of interstate meat. The sections on diseases and pathologic abnormalities are well done from the standpoint of the meat inspector and the procedure followed of defining the condition or disease, stating the etiology, giving the postmortem appearances and finally and in definite terms rendering "judgment" is particularly convenient for inspectors. The second volume covers fish and poultry briefly. The lack of detail is somewhat surprising for a country which consumes the amount of fish that Great Britain does. But even more briefly are "other foods" covered, which clearly reveals the author's primary interest in meat inspection. Perhaps this is judging from the standpoint of American industry and when, for example, the size of the British canning industry is considered it is not so surprising that only eleven pages is devoted to it. Each volume contains a short glossary of terms and an index.

Clinical Toxicology. By Clinton H. Thienes, M.D., Ph.D., Professor of Pharmacology and Head of the Department of Pharmacology, School of Medicine, University of Southern California, Los Angeles. Fabrikold Price, $3.50. Pp. 309, with 7 illustrations. Philadelphia: Lea & Febiger, 1940.

As stated in the preface, the author's purpose in writing this book was to provide a classroom textbook and a guide for the general medical practitioner. No attempt has been made to discuss in detail the chemistry, pharmacy or general pharmacology of poisons. The author has departed from the usual scheme of classifying poisons according to their chemical composition and has grouped them according to their mechanism of action or chief presenting symptom. From the standpoint of classroom instruction, such a system appears to be more satisfactory than classification on the basis of chemical behavior. It is not without imperfections, however. Thus one finds phenol discussed under three separate categories: as a corrosive poison, as a convulsant and as a kidney poison. Atropine is listed both as a cerebral convulsant and as a nerve depressant. Such subdivision, although pharmacologically accurate, might prove to be just as confusing to the student as are the incongruities resulting from the chemical classification of poisons. The consideration of the toxicology of specific poisons, which occupies three fourths of the book, is treated in a clear and concise manner. Discussions of diagnosis and specific treatment are reasonably adequate. One might disagree with the author concerning the relative importance of certain toxic agents. Thus it seems difficult to justify the space given to

considerations of poisoning by absinthe, curare, histamine, poke root and phenylhydrazine in view of the omission of more common poisons such as the newer chlorinated solvents (trichlorethylene, tetrachlorethylene, ethylene dichloride), sulfur dioxide, carbon dioxide, chlorine gas, formaldehyde, santonin, potassium permanganate and metals such as antimony, cadmium, copper and silver. The student or physician who desires additional information beyond that provided in this elementary textbook will be disappointed by the author's failure to cite references to the sources of his information. The last fourth of the book is concerned with general principles for the treatment of poisonings, with diagnosis of poisoning according to the symptoms produced and with chemical technics for the detection and estimation of poisons. The analytic methods given are mostly elementary qualitative procedures and, while quite satisfactory for purposes of class instruction, are hardly adequate for clinical diagnostic use. In a recent review of another manual of toxicology, Prof. H. C. Wood aptly remarked that we were apparently experiencing an epidemic of "toxicologitis." Of the four books on the subject which have been published in this country during the past year, this one is probably the most satisfactory for its intended purpose of providing a brief textbook for medical students and clinicians.

Pathologisch-physiologische Grundlagen der Chirurgie. I: Der Stütz- und Bewegungsapparat. Knochengerüst, Gelenke, Muskeln, Sehnen, Sehnenscheiden und Schleimbeutel. Von Dozent Dr. med. habil. Herbert Junghanns, Oberarzt der Chirurgischen Klinik und der Poliklinik der Universität Frankfurt a. Main. II: Harn- und männliche Geschlechts-Organe. Von Dozent Dr. med. habil. Ernst Kraas. III: Darm und Bauchfell. Von Prof. Dr. Victor Orator, Chefarzt am Stadtkrankenhaus Duisburg. Paper. Price, 9.60 marks; 4.20 marks; 8 marks. Pp. 118; 46; 92, with 8 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

This monograph is in general well organized and written. The field is well covered, though several topics could be included with benefit; e. g., bone tumors are not discussed. The author includes some original work, observations and ideas, and presents problems which bear further research work. The bibliography is large, but there are several glaring omissions.

Part II is well written but in many places incomplete. It is brief, to the point and well subdivided, but the many omissions keep it from being a good monograph. The kidney in relation to hypertension (Goldblatt kidney) is not mentioned. The entire chapter on the male sex organs is only two and a half pages long. The innervation of these organs is not mentioned. The endocrine aspects of prostatic hypertrophy are not discussed. Among other subjects missing are hermaphroditism and eunuchoidism.

Part III is the least well written of the three monographs. The German is difficult to read, the punctuation is poor and there are many typographic errors. While some normal physiologic processes of digestion are thoroughly discussed, there are so many subjects omitted that the book is hardly worth the time taken to read it.

Treatment of War Wounds and Fractures with Special Reference to the Closed Method as Used in the War in Spain. By J. Trueta, M.D. With a foreword by H. Winnett Orr, M.D., F.A.C.S. Cloth. Price, $2.50. Pp. 146, with 48 illustrations. New York: Paul B. Hoeber, Inc., 1940.

Dr. Trueta reports on the use of closed plaster casts in the treatment of war wounds. He believes that the principal value of the cast is the immobilization which it affords. This allows local venous and capillary thrombi to form which prevent and delay the spread of infection and allow new capillaries to form. Repeated dressings break these down. The plaster maintains a constant beneficial pressure on the wound. He believes that biologic antagonism between the different groups of bacteria renders impossible the colonization of pyogenic organisms and so slows up the septic process. He found Bacillus pyocyaneus in abundance in a number of cases. The immediate care of the wounds is the most important part of the treatment. The steps included are anesthesia, débridement, reduction of the fracture, light packing of the wound with gauze (not with petrolatum as advocated by Dr. Orr) and prophylactic tetanus antitoxin. Then the cast is applied and changed only if the odor becomes unbearable. Failures, he believes, result from inadequate surgical management of the wound before the cast is applied. Special problems in the various regions are discussed. Advantages of the method peculiar to military surgery include the ease of arranging early care and transportation and the small amount of equipment and after-care needed. The treatment of 1,073 compound war fractures with mortality in only six cases is proof of the ability of the author and the soundness of his method.

Clinical and Experimental Investigations on the Creatine Metabolism. By Erling Wang. Acta medica Scandinavica, Supplementum CV. Paper. Pp. 338, with 38 illustrations. Helsingfors: Mercators Tryckeri, 1939.

This monograph, in harmony with others sponsored by the *Acta medica Scandinavica*, permits the author to discuss in some detail the metabolism of creatine on the basis of his own studies and those in the literature. The object of the investigations described was to study the origin and significance of creatinuria and determine whether creatine elimination could be utilized clinically for diagnostic or prognostic purposes. The studies deal largely with creatine metabolism in disturbances of the thyroid gland and in diseases of the muscles but also include studies of creatine-creatinine excretion in such conditions as pernicious anemia (and other blood diseases), uremia, hypertension, heart disease and fever. In thyrotoxicosis the creatinuria was found to be dependent on some action of thyroxine, but this was independent of the basal metabolism. Since creatinuria occurs in a wide variety of conditions, the author concludes that it is an unspecific phenomenon resulting from the general debilitation of the patient and is of clinical value only in judging the extent, severity and course of diseases specifically affecting the muscles. While the author's own studies appear to be well organized and carried to a logical but somewhat detailed conclusion, the discussion of the relatively enormous literature (1,455 references) reveals some inadequacies in the discussion of previous studies bearing on the problem in hand. The book will be found, however, to contain considerable material of interest to students of creatine-creatinine metabolism.

Report of the Chief of the Bureau of Home Economics, 1939. United States Department of Agriculture, Bureau of Home Economics. Paper. Price, 5 cents. Pp. 22. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

This annual report of the Bureau of Home Economics for the fiscal year which ended June 30, 1939, is of interest because the Bureau of Home Economics, a division of the United States Department of Agriculture, conducts investigations that further the well-being of all persons in the United States through more effective use of foods and other agricultural products and works toward improving the living of farm families.

The scope of the Bureau's activities includes economic studies on the level of living a family can achieve on a limited income; foods and nutrition studies on the kinds and amounts of essential nutrients required to maintain and promote maximum health; collection of data on the composition of foods; studies of the influence of methods of production and processing on the quality of foods; textile and clothing studies on the chemical and physical properties of various textile fabrics, studies to determine the best quality of fibers and the best fabric construction for particular use, and the development of an improved basis for sizing children's garments and patterns; housing and equipment studies on the minimum space requirements for effective arrangement of needed equipment, work spaces and storage spaces.

Bulletins describing these studies were prepared and published during the year together with articles in outside journals. A list of the publications and articles is provided in this report.

Elements of Human Physiology. By Miriam Scott Lucas, B.S., Ph.D. Cloth. Price, $4.50. Pp. 400, with 158 illustrations. Philadelphia: Lea & Febiger, 1940.

This textbook was written for college courses and is based on actual teaching experience. While brief and concise, the scope of subject matter seems well balanced, well integrated and correlated. Some of the illustrations are original, some reproduced from standard sources. There are twenty tables. On the whole, the work seems somewhat superior to most recent college textbooks despite a certain degree of dogmatic presentation. This the author, in the preface, justifies on the ground that controversial subjects should not be stressed too much with the class of students for whom the book is designed. Probably such a view is justified. Certainly no one will be misinformed by any of the material presented.

Chronic Manganese Poisoning in an Ore-Crushing Mill. By Robert H. Flinn, Passed Assistant Surgeon, and others. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 247. Paper. Price, 15 cents. Pp. 77, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

Eleven cases of chronic manganese poisoning are reported in this engineering and medical survey of an ore-crushing mill. These observations point out the interesting neurologic manifestations of long-standing manganese intoxication, especially the similarity to such nervous disorders as multiple sclerosis. The distinguishing features are a history of exposure to sufficient concentrations of manganese dust over a long enough time, the appearance of muscular stiffness and incoordination progressing to marked alterations in speech and gait, relative and absolute diminution of neutrophils, lowered blood calcium, and a slight reduction in the middle zone of Lange's test. No cases of chronic poisoning were discovered in exposures of less than 30 mg. of manganese per cubic meter, but caution is expressed not to accept such a figure as a threshold limit. The necropsy in one case demonstrated that the lungs were the principal port of entry and major loci of stored manganese; the liver and kidneys were not found to be greatly changed. Postmortem changes prevented microscopic study of the brain and cord. This report indicates that manganese poisoning is entirely unnecessary and that modern equipment can control the exposure.

Biography of Dr. Joseph Strong 1770-1812, Philadelphia Physician. By Lockwood Barr. Paper. Pp. 43. Pelham Manor, N. Y.: The Author, 1940.

Joseph Strong was born in Connecticut in 1770, studied medicine, practiced in Philadelphia after the Revolutionary War and died in 1812. He is credited with having been the inventor of the tourniquet, and the members of his family who have published this biography are seeking earnestly a specimen of the type of tourniquet he invented so that they may present it to the Yale School of Medicine. In his early days he made some mechanical inventions anticipating the principle of the bicycle. He also obtained a patent on a carriage propeller. He studied medicine in the University of Pennsylvania; although he did not graduate, he attended a course of lectures by Benjamin Rush. Dr. Strong was a member of the group known as the Hartford Wits, whose poems were published in 1793 in an anthology. He was from 1793 onward surgeon in the army in charge of the army hospital 22 miles south of Pittsburgh. The record of his life is an intimate account of an interesting character.

Synopsis of Obstetrics. By Jennings C. Litzenberg, M.D., F.A.C.S. Fabrikoid. Price, $4.50. Pp. 394, with 157 illustrations. St. Louis: C. V. Mosby Company, 1940.

It is difficult to present the subject of obstetrics in outline form, particularly when the size of the book is limited. Nevertheless the author, who has been one of the leading teachers of obstetrics for more than a generation, has skilfully accomplished his purpose. He has arranged the important details of obstetrics in brief and succinct sentences. The treatment recommended by the author is conservative and in accordance with present day teachings. The book is well illustrated but nearly all the illustrations were borrowed from other books. This synopsis should prove helpful to medical students and to general practitioners who want to review various obstetric subjects with a minimum of time and effort.

Unconquered Enemy. By Boris Sokoloff, M.D., Sc.D. Cloth. Price, $1.75. Pp. 198. New York: Greystone Press, 1940.

This is an extensive and detailed discussion of cancer research by a man who has been in close touch with research scientists all his life. The book is full of useful and interesting information for the cultured person of an inquiring turn of mind who likes his facts with a background of history and embroidered with descriptions of the scientists whose work is cited and of the laboratories in which they labored. The book is too technical for reading by persons of limited education. It contains too much speculative material of interest to the scientist and the seeker after information for its own sake to be of use to the practical individual who wants to know merely what science has learned about cancer and how such knowledge must be applied definitely to his own situation. In the chapter about the curability of cancer there is much information which will do more to alarm the reader than reassure him, although the conclusions reached are in accord with the general attitude of scientific and clinical observers, namely that there is more hope on the cancer horizon than there has been in previous years. The general style of the book and the inclusion of bibliographic references, largely to the medical literature, are characteristic of the work of the scientist emerging briefly from the cloister of the laboratory to share his precious information with an ignorant public, but not being able to depart wholly from the scientific method of communication. For this reason, unfortunately, this excellent book may have too limited an audience.

Diagnostica differenziale delle emopatie. Di Edoardo Storti. Estratto da "Diagnostica medica differenziale," di Adolfo Ferrata. Paper. Pp. 357, with 79 illustrations. Milan: Cromotipia E. Sormani, 1939.

Here is a monograph on the blood dyscrasias. The first two chapters deal with the genesis and morphology of the various types of blood cells. Two excellent colored charts illustrate all three types of blood cellular elements. The third chapter deals with the anemias. This includes the symptoms, the signs and the hematologic classifications of the anemias. There are in this chapter several colored plates illustrating the various types of anemia, as well as the appearance of the bone marrow in pernicious anemia in a state of relapse. The chapters on the myeloses, the hemorrhagic diseases and the diseases of the lymph glands are complete and well illustrated in color as well as black and white. The chapter on splenomegaly is complete, as is the one on polycythemia. The last chapter illustrates a sternal puncture and a splenic puncture vividly and clearly, as well as a lymph gland puncture. The colored plates of all three of these conditions are excellent. This book is an excellent monograph on the diagnosis and differential diagnosis of the blood dyscrasias, with as fine colored plates of the peripheral blood cells, as well as bone marrow sections, as can be found in any of the textbooks or blood atlases.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Act (Minnesota): Right of Injured Employee to Select Physician at Employer's Expense.—Carmody was injured in the course of his employment with the city of St. Paul. He obtained medical treatment from his family physician and refused to accept the services of any of the physicians designated by the city to treat him. The city paid him compensation during the period of his disability and such hospital expenses as were necessitated by his injuries but refused to pay his physician's bill of $110. In subsequent proceedings instituted under the workmen's compensation act of Minnesota by Carmody the industrial commission upheld the city, and the workman brought certiorari to the Supreme Court of Minnesota.

The sole question to be determined, said the Supreme Court, is whether or not an injured workman who has been treated by a physician of his own choice can require his employer to pay for the reasonable value of the physician's services when the employer is willing and ready, to the knowledge of the workman, to furnish and pay for medical treatment by a physician of the employer's choice. To determine that question the court regarded it as essential to discuss the legislative history of pertinent provisions of the workmen's compensation act of Minnesota in the light of a prior court decision rendered thereunder. The act originally adopted in 1913 provided

> such medical and surgical treatment . . . as may be reasonably required at the time of the injury and thereafter during the disability, but not exceeding ninety (90) days, to cure and relieve from the effects of the injury, the same to be provided by the employer and in case of his inability or refusal seasonably to do so, the employer to be liable for the reasonable expense incurred by or on behalf of the employe in providing

the same; provided, however, that the total liability . . . shall not exceed the sum of one hundred dollars. . . . (Laws, 1913, c. 467, section 18).

In 1921, after study by an interim committee, the section just quoted was amended so as to provide that such medical and surgical treatment

as may reasonably be required at the time of the injury, and during the disability for not exceeding ninety (90) days and not exceeding one hundred ($100.00) dollars in value, to cure and relieve from the effects of the injury, shall be provided by the employer and in case of his inability or refusal seasonably to do so, the employer shall be liable for the reasonable expense incurred by or on behalf of the employe in providing the same. . . .

The Commission may upon the petition of an *employe* and a proper showing of cause therefor order a change of physicians and designate a physician suggested by the injured employe or by the Commission itself and in such case the expense thereof shall be borne by the employer [within the limitation just noted]. (Laws, 1921, c. 82, section 19.)

The interim committee in reporting to the Minnesota house of representatives on the bill, which on its enactment became the law just quoted, stated: "This provision [referring to the paragraph of quoted matter which authorized a change of physicians on the petition of an employee] is intended to overcome the objection to permitting the employer to select any physician and require the employe to accept him."

In *Lading* v. *City of Duluth*, 153 Minn. 464, 190 N. W. 981, a case involving facts similar to those in the instant case and decided while the workmen's compensation act as amended in 1921 was still in force, this court held that Lading, an injured employee of the city of Duluth, could not recover the reasonable value of the services rendered by a physician of his own choice because it had not been shown either that the employer was unable to furnish a physician or that he had refused to do so. However, in holding that the employer was liable to reimburse Lading to the extent of $100, the statutory limit at that time, this court said:

But we are of opinion that the statute should not be construed to impose upon the employee the unqualified obligation to accept the physician selected by the employer, or forfeit the right of reimbursement there given. It often happens, a situation perhaps more or less general, that the employee has a family physician to whom he prefers to turn in case of injury or sickness, rather than to accept the services of another with whom he has no acquaintance, or in whom perchance he has no confidence. In that situation he should have the option or unquestioned right to choose his medical attendant, or accept the one tendered him by the employer, but within the limits of liability on the part of the employer imposed by the statute. The statute contains no language unconditionally requiring the latter to accept the physician tendered him or relinquish the right of reimbursement altogether, and we construe it to give him that option. . . .

Undoubtedly, continued the court, the construction adopted by us in the Lading case diametrically opposed the purpose of the lawmakers, as evidenced in the report of the interim committee, to vest in the employer in the first instance the right to designate the physician to treat a workman who had sustained an industrial injury. However, the court was of the opinion that the rule announced in the Lading decision should not now be altered in view of the fact that the legislature, which was aware of the holding in that case, had made no subsequent attempt to amend the pertinent provisions of the compensation act relating to choice of a physician. This legislative inaction, the court held, constituted acceptance by the legislature of the statutory construction laid down in the Lading case. In 1923 the legislature again amended the provisions in question without altering the respective fundamental rights and duties of employer and employee except that the financial limit on the employer's liability was removed and the employer was also given the right to apply for a change of physicians. Manifestly, said the court, the 1923 legislature, if it had not intended to adopt the construction placed on these provisions by the Lading decision, could have specifically provided, which it did not, that the employer could designate a physician whose services the employee must accept or forfeit any claim against the employer for services rendered by a physician of his own choice. Again in 1929 the legislature reenacted the provisions in question of the 1923 law except that the ninety day limit was eliminated. Consequently, despite repeated opportunities to alter the rule of the Lading case, the legislature has not done so. Inasmuch as the holding in the Lading decision had become a part of the compensation law, since it had, in effect, been adopted by the legislature, the court was unwilling at this late stage to reexamine that decision to determine its soundness or unsoundness, and it believed that any change, if needed, should be made by the legislature.

The court accordingly concluded that the workman should have been awarded the amount claimed for medical services, which amount was stipulated to be reasonable. It therefore reversed the order of the commission denying the workman's claim and remanded the cause with directions to award the workman the money spent by him in employing his own physician.—*Carmody v. City of St. Paul (Minn.) 291 N. W. 895.*

Workmen's Compensation Act (Minnesota): Right of Injured Workman to Change Physicians at Expense of Employer.—Morrell, an employee of the city of Austin, Minn., on Jan. 26, 1935, in the course of his employment suffered "painful and lasting injuries" necessitating his submitting to a herniotomy and to a lumbosacral fusion operation on his spine. Immediately after the accident he was placed under the care of a physician selected by the city and its insurer. Eight months later he was examined by another physician, selected by his employer and its insurer, who reported that Morrell's condition was due to congenital abnormalities not caused by or associated with the industrial accident. Apparently medical attention was discontinued even though the workman continued to suffer and was confined to bed most of the time. In March 1936 Morrell wrote to the industrial commission of Minnesota and asked to be sent to the Mayo Clinic and for advice as to how that could be done free of expense to himself. He received a reply from an attorney for the commission advising him to obtain the authorization of his employer's insurer so as to avoid a dispute later on, since "the employer and insurer under compensation have the exclusive right to appoint the attending physician" if they are to be liable for expenses. The workman communicated with the insurer and was eventually instructed to go to Minneapolis to submit to an operation there by physicians designated by the insurer. He was told that if he went to the Mayo Clinic it would be at his own expense. Nevertheless, he went to that clinic and underwent a herniotomy in May 1936. In April 1937 another operation, described as a "difficult surgical matter, involving as it did a 'lumbosacral fusion' of the spine," was performed at the same clinic. Satisfactory recovery apparently resulted. The workman instituted proceedings under the workmen's compensation act of Minnesota to recover from the employer and its insurer the cost of the medical and hospital services incurred at the clinic. While the commission found that the services rendered at the clinic were given to cure and relieve conditions caused by the industrial injury, it denied the workman's claim because he had made "his own selection and failed to secure the permission of the employer or the insurer herein so to do or to secure from the industrial commission . . . an order for change of physicians." The workman then brought certiorari to the Supreme Court of Minnesota.

The right of the workman, said the Supreme Court, to be reimbursed by the employer and its insurer for the services rendered him at the clinic must be determined in the light of the provisions of the workmen's compensation act relating to the furnishing or supplying of medical care necessary "to cure and relieve from the effects" of an industrial injury. In this respect, 1 Mason Minn. St. 1927, section 4279, provides

[the employer] shall furnish such medical, surgical and hospital treatment, including nursing, medicines, medical and surgical supplies, crutches and apparatus, including artificial members, as may reasonably be required at the time of the injury, and during the disability . . . to cure and relieve from the effects of the injury, *provided that in case of his inability or refusal seasonably to do so, the employer shall be liable for the reasonable expense incurred by or on behalf of the employe in providing the same.* . . .

The Commission *may at any time* upon the request of an employe or employer *order a change of physicians and designate a physician suggested by the injured employe* or by the Commission itself *and in such case the expense thereof shall be borne by the employer* . . .

In the opinion of the court, inasmuch as Morrell's employer and its insurer and the physicians selected by them had, for a period of more than sixteen months, fumbled and delayed the discovery and treatment of Morrell's real condition, the conduct of the employer and its insurer constituted, within the meaning of the statute, "inability or refusal seasonably" to furnish necessary

treatment. The section in question, continued the court, authorizes the commission to "order a change of physicians" at any time, but in selecting another physician it must designate either one "suggested by the injured employe" or one of its own choice. While either employer or employee may "request" a change of physicians, only the employee or the commission may "designate" such physician. In the instant case the commission did not "refuse" the workman's request for a change of physicians. However, it erroneously advised the workman to obtain the consent of his employer and its insurer because they had "the exclusive right to appoint the attending physician." In other words, the commission washed its hands of the whole affair and never exercised its granted authority. Its inaction permitted the employer and its insurer to be adamant in erroneously claiming that if the workman did not accept their chosen physicians they would be "compelled to decline to assume any responsibility whatsoever for any expense incurred."

The workman, continued the court, was an ordinary working man wholly uninformed as to procedural requirements and was without aid of counsel. He was left completely ignorant as to the true legal course to pursue to get needed professional aid. He indicated his choice of medical service in language that no one could misunderstand. His own rehabilitation was uppermost in his mind. The wisdom of that choice is apparent from the results obtained. In view of the reasoning adopted by this court in *Carmody* v. *City of St. Paul,* 207 Minn. 419, 291 N. W. 895 (abstracted on the preceding page), it is clear that the workman is entitled to reimbursement for the medical and hospital expenses incurred and paid by him. However, said the court, if the employer and the insurer had correctly informed the workman of his rights and if he had then ignored them, a different result might now be compelled.

The Supreme Court accordingly reversed the order of the commission denying the workman's claim and instructed the commission to allow the workman reimbursement from the employer and its insurer for the amount of the charges made by the clinic. —*Morrell v. City of Austin et al. (Minn.), 293 N. W. 144.*

Contraceptives: Unlawful in Connecticut for Physician to Prescribe or Advise Use of Contraceptive Drugs or Devices.—Two physicians, Nelson and Goodrich, prescribed and advised the use of a certain spermatocidal drug and a certain contraceptive device by a married woman who sought their advice. The purpose of advising the use of such drug and device admittedly was to prevent conception, and the patient actually used them for that purpose. Subsequently the two physicians and the trained nurse who carried out their prescription, Clara McTernan, were prosecuted by the state in three separate actions for violation of the statutory law of Connecticut, which provides that any person who shall use any drug, medicinal article or instrument for the purpose of preventing conception, or who shall assist, abet, counsel or cause another to commit such an offense shall be fined or imprisoned or both (General Statutes of Connecticut, 1930, sections 6246 and 6562). The defendants claimed that, since their advice and conduct was necessary to preserve the "general health" of their patient, they had done no wrong. From judgments of the trial court sustaining the defendants' demurrers and holding the defendants not guilty, the state appealed to the Supreme Court of Errors of Connecticut.

The Supreme Court of Errors could not agree with the defendants' contention that either the statutory law in question should be construed so as to include an exception protecting the right of a physician to prescribe contraceptive measures when in his opinion such steps are necessary to preserve the "general health" of his patient or else the statute was unconstitutional. In the judgment of the court the wording of the statute was clear and unambiguous and contained no provision excepting a physician from its terms. Furthermore, no legislative intent to exempt physicians could be implied because at each session from 1923 to 1935 the legislature had rejected bills proposing to amend the statute in question so as to exempt the use of contraceptive drugs and devices on the prescription of a physician and to exempt the sale of such drugs and devices to physicians on their prescriptions. The defendants' contention, that the statute in question was unconstitutional because without due process of law, it deprived the people of their natural right to decide whether or not they should have children and to use contraceptives if they decided not to have them, likewise did not meet with the court's approval. Under its police power a state may legislate to preserve and protect the public morals and to aid what is sanctioned by usage or held by the prevailing morality to be necessary to the public welfare. It must be assumed, said the court, that at the time the statute was originally enacted the legislature was aware of opposing views concerning contraceptives and that it deliberately chose between them. This is especially true since the legislature has repeatedly refused to modify the statute by amendment. The court believed that it was not for it to say that the legislature might not reasonably hold that artificial limitation of even legitimate child-bearing would be inimical to the public welfare and that the use of contraceptives would be injurious to public morals. In fact, the legislature was not precluded from considering that not all married people are immune from temptation or inclination to extramarital indulgence and that the risk of illegitimate pregnancy is a recognized deterrent deemed desirable in the interests of morality. The court concluded, therefore, that the statute was constitutional. It added, however, that if the statute was unwise or unreasonably comprehensive, the appeal should be to the legislature and not to the court.

Accordingly, the judgments of not guilty were reversed and the causes remanded with instructions that the defendants' demurrers be overruled.—*State v. Nelson; State v. Goodrich; State v. McTernan (Conn.), 11 A. (2d) 856.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Cleveland, Oct. 6-11. Dr. William P. Wherry, 107 South 17th St., Omaha, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Excelsior Springs, Mo., Sept. 26-28. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Association of Railway Surgeons, Chicago, Sept. 16-18. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.

American Clinical and Climatological Association, White Sulphur Springs, W. Va., Oct. 28-30. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Chicago, Oct. 21-25. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.

American Hospital Association, Boston, Sept. 16-20. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.

American Public Health Association, Detroit, Oct. 8-11. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Roentgen Ray Society, Boston, Oct. 1-4. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.

American Society of Anesthetists, New York, Oct. 10. Dr. Paul M. Wood, 745 Fifth Avenue, New York, Secretary.

Association of Military Surgeons of the United States, Cleveland, Oct. 10-12. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Central Society for Clinical Research, Chicago, Nov. 1-2. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.

Clinical Orthopaedic Society, Milwaukee and Madison, Wis., Oct. 18-19. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 15-17. Mr. Theodore Wiprud, 1718 M St., N.W., Washington, Secretary.

Indiana State Medical Association, French Lick, Oct. 29-31. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Cleveland, Oct. 14-18. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Kentucky State Medical Association, Lexington, Sept. 16-19. Dr. A. T. McCormack, 620 South Third St., Louisville, Secretary.

Michigan State Medical Society, Detroit, Sept. 24-27. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Mississippi Valley Medical Society, Rock Island, Ill., Sept. 25-27. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Las Vegas, Oct. 11-12. Dr. Horace J. Brown, 120 North Virginia St., Reno, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 28-Nov. 1. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Pacific Association of Railway Surgeons, Reno, Nev., Sept. 20-21. Dr. W. T. Cummins, 1400 Fell St., San Francisco, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, San Francisco, Nov. 6-9. Dr. T. Floyd Bell, 400 Twenty-Ninth St., Oakland, Calif., Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Sept. 30-Oct. 3. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Southern Minnesota Medical Association, Red Wing, Sept. 23. Dr. Harold C. Habein, 102 Second Ave., Rochester, Secretary.

Vermont State Medical Society, Rutland, Oct. 9-10. Dr. B. F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. J. G. Crownhart, 110 East Main St., Madison, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

40:1-180 (July) 1940. **Partial Index**

Nutrition Study in Pregnancy: Correlation Between Dietary Survey of Vitamin A Content and Dark Adaptation Time. P. F. Williams, B. Hark and Florence G. Fralin, Philadelphia.—p. 1.

*Pregnancy Pyelonephritis in Relation to Renal Damage and Hypertension: Clinical Study of Forty-Five Cases of Pyelonephritis More Than Five to Ten Years After Infection. E. G. Crabtree and D. E. Reid, Boston.—p. 17.

*Erythroblastosis Foetalis: Report of Twenty-Seven Cases. S. A. Wolfe and I. Neigus, Brooklyn.—p. 31.

Relationship of Thyroid and Adrenal Glands to Toxemias of Pregnancy. E. C. Hughes, Syracuse, N. Y.—p. 48.

Treatment of Oliguria and Anuria. W. J. Dieckmann and S. Kramer, Chicago.—p. 61.

Endometrium-like Mucosa Lining the Fallopian Tube: Its Origin, Differential Characteristics and Clinical Significance. A. A. Marchetti, New York.—p. 69.

Prolapse of Umbilical Cord: Analysis of Fifty-Eight Cases. W. F. Mengert and F. H. Longwell, Iowa City.—p. 79.

Epidemic Infectious Diarrhea of Newborn Infant. R. S. Cron, H. W. Shutter and A. H. Lahmann, Milwaukee.—p. 88.

Effect of Thyroid on Sterility in Normal and Hypothyroid Females. L. B. Winkelstein, New York.—p. 94.

Study of 1,200 Cases of Hysterectomy. P. H. Smith, Evanston, Ill.—p. 118.

Uterine Bleeding in Last Trimester of Pregnancy: Its Diagnostic Significance and Treatment. J. T. Wallace, New York.—p. 128.

Suppression of Lactation by Stilbestrol. C. W. Mucklé, Philadelphia.—p. 133.

Stilbestrol in Treatment of Menopausal Symptoms. F. L. Payne and C. W. Mucklé, Philadelphia.—p. 135.

Use of Helium and Oxygen in Treatment of Asphyxia Neonatorum: Preliminary Communication. H. F. Kane, Washington, D. C.—p. 140.

Renal Insufficiency Following Transfusion of Compatible Blood. H. H. Brainard, New York.—p. 142.

Film Scales for Use in Pelvimetric Roentgenography. J. B. Jacobs, Washington, D. C.—p. 150.

Successive, Coexistent Tubal Pregnancies. C. A. Behney and W. J. Hanes, Philadelphia.—p. 155.

Removal of Gräfenburg Ring Without Interruption of Pregnancy. R. A. Kimbrough Jr. and P. Tompkins, Philadelphia.—p. 156.

Pregnancy Pyelonephritis, Renal Damage and Hypertension.—Crabtree and Reid point out that in infections of the urinary tract in pregnancy and in the puerperium there is little evidence in most cases of renal insufficiency and, where such insufficiency has been demonstrated, there is prompt return to normal function. These apparent facts tended to strengthen the view that pyelonephritis is a transitory disorder. Obstetric and urologic practice have been dominated by this point of view to such an extent that preservation of the fetus, even in severe cases of pyelonephritis of pregnancy, has been made paramount unless immediate danger to the mother was indicated. The newer concept of the severity of the remote effects of pregnancy pyelonephritis now threatens a reversal of policy. Some writers are prepared to advocate interruption of pregnancy on evidence which obstetricians consider inadequate. The authors think that, until some of these questions have been answered through clinical study of apparently healthy women who have had the disease, a radical policy of interruption of pregnancy for pyelonephritis is no more logical than a policy which preserves the pregnancy at any cost to the mother short of death. In a survey of forty-five patients with pyelonephritis of pregnancy the authors produce evidence by intravenous pyelography, intravenous phenolsulfonphthalein excretion, concentration of the urine test and tests for nitrogen retention to indicate that a high percentage of patients suffer appreciable damage to their kidneys which is demonstrable at from five to ten years after the infection. For the majority adequate renal function is present at that time. The prognosis is grave for the patient who has had both toxemic and pyelonephritic injury. All three patients who had had both toxemia and pyelonephritis had hypertension. Two of the three were dead five years after the injury. Six patients with pyelonephritis showed blood pressure readings above 150/90, associated with some evidence of renal deficiency at that stage of the disease. Renal damage consisted of injury both to the conduction channels, pelvis and ureter and to the cortex. When there is injury to the conducting channels, urinary stasis may further injure the cortex, especially when infection is still present. Five of the forty-five patients studied had stone. Evidence of total renal deficiency was present at the time of examination in some proved unilateral cases. This suggested some other injury than bacterial invasion for the second kidney. The authors gained the impression that pyelonephritis of pregnancy should be looked on as a progressive disease in many cases. Data have not yet been produced to indicate to what extent it shortens life. Some of the cases which were subnormal may have shown only the original damage and may now be in a stationary state. Sufficient evidence has been produced to indicate that the aim in treatment in pyelonephritis associated with pregnancy should be to minimize the initial injury and clear the infection as soon as possible.

Erythroblastosis Foetalis.—According to Wolfe and Neigus, erythroblastosis foetalis is a disease of the blood-forming organs of the newborn infant, which results in an anemia characterized by the presence of an excessive number of immature red blood cells in the circulation. Hydrops foetalis, icterus gravis neonatorum and anemia haemolytica neonatorum are the three clinical types of erythroblastosis. Overlapping features are not infrequent. Five infants in the icteric group presented circumscribed edema. Icterus was the first symptom in the three infants of the anemia group. Erythroblastosis foetalis is not rare. Twenty-seven cases were encountered in 15,334 deliveries, an incidence of one in every 568 confinements. There were four cases of hydrops foetalis, twenty cases of icterus gravis and three instances of anemia haemolytica. Persisting hematopoiesis in the liver and spleen is the dominant pathologic aspect. The bone marrow is hyperplastic. Extramedullary hematopoiesis is often encountered in the pancreas, kidneys and adrenal glands. The hemoglobin and red cells are reduced but the color index is above standard. The total number of nucleated cells is increased with an abnormally high ratio of early red blood cells (normoblasts and erythroblasts). A tendency for recurrence in successive pregnancies is noteworthy. Four such cases are reported among nineteen mothers of the icteric group. Recurrent stillbirths were observed in 75 per cent of mothers with hydropic children and in 21 per cent of mothers who had delivered icteric progeny. Toxemia of pregnancy is above the normal incidence but of only moderate severity; it was noted in 50 per cent of the hydrops group in 20 per cent of the mothers in the icteric group. Premature labor is frequent; it was encountered in all the hydrops cases and in 30 per cent of the icteric series. In hydrops foetalis the distended abdomen may cause dystocia. This was observed in two of four infants in the series. Hydrops foetalis is the fatal type of erythroblastosis. All four infants in this group perished. Intrapartum diagnosis of hydrops foetalis is possible by x-ray examination. It should be regularly employed when a history of recurrent stillbirths or definite erythroblastosis is obtained. Icterus gravis is a severe form of erythroblastosis; fifteen of twenty infants succumbed. Jaundice is the most prominent symptom but may not appear for from twenty-four to forty-eight hours after birth. There is enlargement of the liver and spleen. Cerebral hemorrhage is frequent and often precludes recovery. Anemia haemolytica neonatorum is the mildest form of erythroblastosis; all three infants recovered. Pallor of the skin and mucous membranes may be preceded by mild icterus. Enlargement of the liver and spleen, or both, and an increased number of normoblasts in the smear afford prompt diagnosis. Early and repeated transfusions comprise the ideal method of therapy for icterus gravis. The five infants who recovered received such prompt treatment. Iron and liver extract are valuable adjuncts to transfusion in the anemia group. A history of repeated stillbirths indicates careful search for erythroblastosis as the underlying cause.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

44:1-160 (July) 1940

Pneumo-Encephalographic Appearance of Hemangioblastoma of Cerebellum. C. G. Dyke and L. M. Davidoff, New York.—p. 1.
Discussion of Roentgen Pelvimetry and Description of a Roentgen Pelvimeter. H. Thoms, New Haven, Conn.—p. 9.
Polyostotic Fibrous Dysplasia: Report of Case with Unilateral Involvement. R. C. Moehlig and F. Schreiber, Detroit.—p. 17.
Practical Applications of Body Section Roentgenography. S. Moore, St. Louis.—p. 24.
Bone Changes in Leukemia. K. Mendl and O. Saxl, Brno, Czechoslovakia.—p. 31.
Roentgenologic Study of Hip Joint of Infant in First Twelve Months of Life, with Reference to Early Diagnosis of Its Congenital Dislocation. M. S. Burman, New York, and H. C. Clark, New Rochelle, N. Y.—p. 37.
Diagnostic Errors in Ulcerative Lesions of Stomach and Duodenum. E. Freedman and H. D. Goehring, Cleveland.—p. 48.
Roentgenologic Study of Gastric Tuberculosis. A. J. Ackermann, Oklahoma City.—p. 59.
Intestinal Obstruction at Terminal Ileum Caused by Large Irregular Gallstone: Report of Case. J. M. Flynn, Rochester, N. Y.—p. 69.
*Respiration Pyelography: Study of Renal Motion in Health and Disease. R. D. Bacon, Erie, Pa.—p. 71.
Experiences in Treatment of Primary Skeletal Sarcoma by Irradiation. A. Brunschwig and D. Tschetter, Chicago.—p. 83.
Observations on Circulatory Changes in Bone. F. A. Chandler, Chicago.—p. 90.
*Preoperative Irradiation of Breast. W. E. Howes and H. Bolker, Brooklyn.—p. 98.
Regression of Carcinoma of Breast Following Artificial Menopause: Case Report. V. W. Archer and G. Cooper Jr., University, Va.—p. 108.
Etiologic Factors in Some Forms of Cancer. D. T. Quigley, Omaha.—p. 110.
Parathyroidism: Follow-Up Notes. H. W. Jacox, J. M. King and F. R. Bailey, Pittsburgh.—p. 113.
Combined Action of Roentgen Rays and Sulfanilamide on Staphylococcus Aureus. R. Flocks, O. N. Fellowes and H. D. Kerr, Iowa City.—p. 115.
Design of 4 Gm. Radium Bomb. A. H. Warner and R. H. Neil, Los Angeles.—p. 117.

Respiration Pyelography.—Bacon employed respiration pyelography in more than 200 cases during the past three years. Respiration pyelography, in his opinion, does not replace routine pyelography but is a valuable supplement. Respiration pyelography in the supine position is indicated when a knowledge of restricted renal or ureteral mobility will be of value. The author prefers it to postural study in these cases because of the ease and accuracy with which it can be carried out. Where the problem is one of excessive mobility and ureteral obstruction, the behavior of the upper urinary tract must be investigated in the supine and in the erect postures. The essential inspiration exposure may be supplemented by a diphasic film, from which may be obtained information regarding relationship of the several parts in the two phases of respiration. The author recommends respiration pyelography as a simple supplementary roentgenographic procedure capable of producing accurately a permanent record of the phenomenon of renal motion. Single film respiration pyelography is a simple procedure which can be utilized wherever pyelography is done. Renal mobility can be estimated in 90 per cent of cases studied in this manner. A movable diaphragm is a sine qua non for normal renal mobility, since the perirenal fascia is a direct extension from the diaphragm. Renal and ureteral anomalies are more adequately demonstrated by means of respiration pyelography than by simple pyelography. The estimation of renal mobility in case of calculus, pyonephrosis and parenchymal and cortical renal lesions gives information which is obtainable in no other manner. Respiration pyelography is a valuable diagnostic procedure in perinephric abscess; renal fixation indicates perirenal involvement. The development and use of respiration pyelography have stimulated a sharper interest in the behavior of the diaphragm and adjacent structures in health and disease.

Preoperative Irradiation of Breast.—Howes and Bolker submitted a series of advanced lesions of the breast to intensive preoperative roentgen therapy. Proof of the malignant character of the lesion should first be obtained, either by means of a small surgical incision or needle biopsy if large doses are to be given, such as would produce violent skin reactions or pleural pulmonitis. The entire breast is crossfired with parallel x-ray beams; one portal is directed through the breast from its medial margin, the other approaches the breast laterally and from behind. The path of the ray is directed so that the beam emerges through the opposite side of the breast and is not directed down into the lung bed. An additional portal to the breast from below may be included. The size of the portal varies from 8 by 10 cm. to 10 by 15 cm. and includes the whole glandular element of the breast. Two hundred roentgens is delivered to each of these two portals for from five to six days a week. The total skin dose is limited not to exceed 6,000 roentgens. The other factors used are 40 to 50 cm. skin-target distance, 200 kilovolts, filtration 2 mm. of copper and 1 mm. of aluminum, half-value layer 1.90 mm. of copper, approximately 20 roentgens per minute. The supraclavicular area is next crossfired through an anterior and posterior portal, usually 8 by 10 cm. in diameter. The axillary portals measure 8 by 10 cm. or 10 by 12 cm. and may be used last, as the cutaneous reaction in both the breast and the supraclavicular areas is by this time distinctly visible and thus the danger of overlapping or allowing a ribbon-like band of unirradiated tissue to remain is minimized. Such a series requires from seven to twelve weeks to complete and the cutaneous reaction in the axilla and other parts is at its height ten days after the last dose. All of the reaction and reepithelization is completed from six weeks to two months following the treatments. After a two to three months interval, radical mastectomy follows. The tumor will often shrink to a small percentage of its original size and metastatic glands in the axilla have been similarly influenced. On the other hand, the authors have had several failures in reducing the size of the original growth and in two instances the mass increased in size during or immediately following radiation therapy. The reduction in size of the tumor often produces an excellent psychologic reaction. Three patients, however, refused operation following this initial response to irradiation. One has since died of liver metastases. Comparison with preirradiation biopsy-permitted observation on the microscopic changes caused by irradiation. The final determination of the efficacy of this procedure is derived from a three to five year end-result. As the time interval in this series has been too short and the series of cases limited in number, no tabulation as to the end-results has as yet been prepared.

Archives of Neurology and Psychiatry, Chicago

44:243-482 (Aug.) 1940

Primary Cortical Centers for Movements of Upper and Lower Limbs in Man: Observations Based on Electrical Stimulation. J. E. Scarff, New York.—p. 243.
Relation of Intracranial Tumors and Symptomatic Epilepsy. W. Penfield, T. C. Erickson and I. Tarlov, Montreal.—p. 300.
*Relation of Experimental Histamine Headache to Migraine and Nonmigraine Headache. T. J. C. von Storch, Boston.—p. 316.
Inhibitory Functions of the Corpus Striatum. G. L. Freeman and L. Krasno, Chicago.—p. 323.
Electro-Encephalographic Studies of Injury to Head. H. H. Jasper, J. Kershman and A. Elvidge, Montreal.—p. 328.
Superstitious Self Protection in Psychopathology. G. C. Caner, Boston.—p. 351.
Prevention of Dislocations and Fractures in Metrazol Convulsions. J. H. Rankin, Woodville, Pa.—p. 362.
Relation of Age to Motor Impairment in Man and in Subhuman Primates. Margaret A. Kennard, New Haven, Conn.—p. 377.
Syndrome of Finger Agnosia, Disorientation for Right and Left, Agraphia and Acalculia: Local Diagnostic Value. J. Gerstmann, New York.—p. 398.

Relation of Histamine Headache to Migraine and Other Headaches.—According to von Storch, evidence has recently been presented which suggests that the mechanism of migraine headache is similar to that of the so-called histamine headache. It was his purpose in this study to investigate other aspects of the relation. A total of 125 experiments was performed on thirty-six patients subject to migraine headache, on twenty-three patients subject to chronic, recurrent nonmigraine headache and on fifteen persons free of headache. The experiments were of three different types. In type A a sudden intravenous injection was given of approximately 0.00034 mg. of histamine per pound (0.00755 mg. per kilogram) of body weight. This dose was regulated according to a tabulation of subthreshold doses; for example, 0.04 mg. was given to patients weighing between 115 and 145 pounds (52 and 66 Kg.). In type B 0.05 mg. of histamine phosphate was injected intravenously, irrespective of the subject's weight. Type C experiments consisted in first giving the proper subthreshold dose, according to tabulation. If this failed to produce headache, the procedure was repeated at three minute intervals, with an increase of 0.01 mg. each time until headache occurred. It was found that

headache may be produced by sudden intravenous injection of minute amounts of histamine phosphate in from 30 to 40 per cent of patients subject to chronic recurrent headache. The same procedure fails to cause headache in those who are free from this complaint. Apparently the threshold for histamine headache is lower among persons subject to chronic recurrent headache than among those not so afflicted. The threshold for histamine headache is somewhat lower for patients subject to migraine headache than for those subject to nonmigraine headache. Among patients subject to migraine attacks the type of headache produced by histamine is frequently similar to migraine headache. Among patients subject to other types of recurrent headache the type produced by histamine is only occasionally similar to the habitual headache. There was no evidence that the cranial vascular tree of patients subject to hemicranial migraine headache is unilaterally hypersensitive to histamine. These observations imply that in migraine and histamine headaches the mechanism productive of pain is somewhat similar.

Archives of Pathology, Chicago

30:465-650 (Aug.) 1940

Acute Ischemic Necrosis of Kidney: Clinicopathologic and Experimental Study. A. Penner and Alice Ida Bernheim, New York.—p. 465.
Histology of Experimental Appendical Obstruction (Rabbit, Ape and Man). R. E. Buirge, C. Dennis, R. L. Varco and O. H. Wangensteen, Minneapolis.—p. 481.
Tissue Culture as Diagnostic Aid in Identification of Atypical Tumors. M. E. Sano and L. W. Smith, Philadelphia.—p. 504.
*Relationship of Body Weight to Cancer Incidence. A. Tannenbaum, Chicago.—p. 509.
Squamous Cell Carcinoma of Eustachian Tube. H. L. Stewart, Bethesda, Md., and M. M. Lieber, Philadelphia.—p. 518.
Chemical Analysis of Liver in Case of Essential Xanthomatosis. H. Wood and H. Reinstein, Boston.—p. 533.
Occurrence and Significance of Congenital Malignant Neoplasms. H. G. Wells, Chicago.—p. 535.

Body Weight and Cancer.—Tannenbaum bases the possibility of a correlation between overweight and cancer mortality on laboratory observations of mice and on statistical data of a number of insurance companies. Experimentation with mice of various strains indicated a lower incidence of tumors and a greater longevity in mice which had been fed rations inferior in quantity by from one half to one third to those of full fed specimens. Analysis of the insurance statistics examined showed, with one exception, that overnutrition and overweight were significant factors in the histories of cancerous persons. Though the results of animal experimentation and of insurance observations strongly suggest a connection between body weight and cancer incidence, the author calls attention to the fact that body weight is the result of complex factors and that, in consequence, no necessarily direct and primary relationship may exist between cancer mortality and body weight. In fact, the factors controlling body weight may be directly more significant than body weight itself. Furthermore, cancer is not a single entity but a group of conditions. Correlation between body weight and carcinoma may therefore exist for some kinds of tumors and not for others. The establishment and maintenance of body weight levels at a minimum compatible with general good health, possibly from 10 to 20 pounds below accepted "normal" levels, may have prophylactic value or at least delay the appearance of the tumor. Further clarification of the relation between cancer and body weight, the author believes, may come from the laboratory where animal material can be controlled and the difficulties inherent in studies on man be eliminated.

Archives of Physical Therapy, Chicago

21:385-448 (July) 1940

Response and Increase in Skin Temperature as Indicators of Efficiency of Vasodilating Drugs by Iontophoresis. D. H. Kling, Los Angeles.—p. 389.
Surgical High Frequency Currents in Cancer of Rectum. T. de Cholnoky, New York.—p. 392.
Practical Implications of Strength-Duration Curves in Early Paralysis. F. B. Moor, Los Angeles; C. W. Dail and K. Kellogg, Loma Linda, Calif.—p. 396.
Role of Physical Therapy in Fractures. M. E. Knapp, Minneapolis.—p. 401.
Short Wave Diathermy in Nasal Sinus Disease. F. L. Wahrer, Marshalltown, Iowa.—p. 410.
Present Status of the Hearing Aid Problem. H. A. Carter, Chicago.—p. 414.
Detachment of Retina: Evolution of Its Modern Management. A. Posner, New York.—p. 420.

Delaware State Medical Journal, Wilmington

12:155-170 (July) 1940

Use of Heparin in Treating Case of Subacute Bacterial Endocarditis with Patent Ductus Arteriosus. E. R. Miller, Wilmington.—p. 155.
Bronchiectasis: Its Clinical Aspect. L. B. Flinn, Wilmington.—p. 159.
Diagnosis of Bronchiectasis, Bronchoscopy and Bronchography. W. M. Pierson, Wilmington.—p. 161.

Florida Medical Association Journal, Jacksonville

27:3-54 (July) 1940

Early Recognition of Bleeding Lesions of Gastrointestinal Tract. B. R. Kirklin, Rochester, Minn.—p. 13.
Experimental Atabrine Therapy in Granuloma Inguinale. A. Brown, Jacksonville.—p. 15.
Pyelonephritis: Recent Improvements in Treatment. J. J. Nugent, Miami.—p. 18.
A Young Doctor Looks at Socialized Medicine. R. C. Cumming, Ocala.—p. 23.
Syphilis: A Few General Considerations. W. E. Murphree, Gainesville.—p. 25.
Low Back Pain. J. M. Hoffman, Pensacola.—p. 30.
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Iowa State Medical Society Journal, Des Moines

30:381-424 (Aug.) 1940

Deficiency States and Their Treatment. A. M. Snell, Rochester, Minn.—p. 381.
Common Basis of Psychotherapy and General Therapy. A. H. Woods, Iowa City.—p. 384.
Weed Dermatitis. T. L. Trunnell, Iowa City.—p. 390.
Vitamins in Ophthalmology. B. F. Kilgore, Des Moines.—p. 394.
Complications in Middle Ear Diseases Following Sulfanilamide Therapy. F. H. Reuling, Waterloo.—p. 400.
Intra-Abdominal or Peritoneal Adhesions. E. M. Kersten, Fort Dodge.—p. 403.
Symptoms and Diagnosis of Joint Diseases. K. R. Werndorff, Council Bluffs.—p. 407.
Carcinoma of Stomach Associated with Pernicious Anemia. A. B. Nesler, Dubuque.—p. 410.

Journal of Allergy, St. Louis

11:439-536 (July) 1940

Experimental and Clinical Study of Fresh and Modified Pollen Extracts. A. Stull, R. A. Cooke, W. B. Sherman, S. Hebald and S. F. Hampton, New York.—p. 439.
Experimental Alimentary Allergy and Its Prevention. J. Bronfenbrenner, D. M. Hetler, Frances M. Love and J. M. Burnett, St. Louis.—p. 466.
Studies in Food Allergy: I. Antigenic Relationship of Shellfish. L. Tuft and G. I. Blumstein, with technical assistance of S. Usher, Philadelphia.—p. 475.
Studies on Extracts Made from Pollens Ground in a Ball Mill. P. H. Langner Jr. and R. A. Kern, Philadelphia.—p. 488.
Effect of Pollen Contact on Age of Onset of Hay Fever. J. A. Clarke Jr. and H. C. Leopold, Philadelphia.—p. 494.
*Oral versus Parenteral Pollen Therapy: Clinical Study. B. B. Alperstein, Brooklyn.—p. 498.

Oral versus Parenteral Pollen Therapy.—Alperstein evaluated the therapeutic effect of the oral method of pollen therapy as compared with the parenteral. Fifty patients sensitive to ragweed were placed on the oral pollen therapy. They reported twice a week preseasonally and were given each time a capsule of dried ragweed pollen. The first dose consisted of 500 noon pollen units and doses were gradually increased until a total of 90,000 noon units per dose had been reached. The dose was then reduced to 60,000 noon units. The fifty patients taking oral therapy could be divided into two groups. The first group of twenty-six had not taken treatment for hay fever in previous seasons. These twenty-six reported that they had had (before 1938) from moderate to severe symptoms. During this season (the fall of 1938) on oral pollen therapy, twelve of twenty-six, or 46 per cent, obtained above average relief, whereas eight of twenty-six, or 31 per cent, received no relief. A second group consisting of twenty-four patients had been treated parenterally in prior seasons. These patients obtained better results in 1938 on oral therapy than before 1938 on the parenteral method. In this second group the results were better than in the first group. Here only four failed to get relief, while in the first group there were eight. A conclusion may be made that an added impetus toward improvement in the second group was due to the cumulative effect of parenteral treatment in previous seasons. The failures in both groups had multiple sensitivities (to foods and other inhalants). This may account for the few

poor results. Neither the site of allergic manifestations nor the degree of sensitivity bore any relation to clinical relief of symptoms under any mode of treatment. Unpredictable reactions occurred with the oral method. The range of dosage (by the oral method) within which reactions occurred was quite wide, anywhere from 1,000 to 90,000 noon units. The reactions were of three types, gastrointestinal, respiratory and systemic. The parenteral method gave a greater percentage of satisfactory relief as well as a smaller percentage of complete failures than did the oral method. In view of the unpredictable reactions, a rigid schedule for oral pollen therapy cannot be planned for self administration by patients. It is inadvisable to allow patients to treat themselves by the oral method. The experiments with the blood and urine of patients treated orally show that (*a*) an appreciable amount of pollen is absorbed through the gastrointestinal tract and (*b*) reagin and allergen coexist in the circulating blood at the same time at the height of treatment. The oral method is not recommended, as it has no particular advantage over the parenteral method; nor do the results obtained show nearly as much beneficial clinical relief as those obtained by the parenteral method.

Kentucky Medical Journal, Bowling Green

38:325-362 (Aug.) 1940

Treatment of Thrombophlebitis. W. Barrow, Lexington.—p. 326.
Surgery of Breast: Anatomic and Physiologic Considerations. L. E. Hurt, Lexington.—p. 330.
Cervix Uteri and Its Relation to Childbirth. W. T. McConnell, Louisville.—p. 333.
Treatment of Gonorrhea in the Male. D. E. Scott, Lexington.—p. 336.
Anemia as a Problem for the Surgeon. H. Gordon, Louisville.—p. 341.
Gonorrheal Urethritis in the Male. W. P. McKee, Eminence.—p. 343.
Present Status of Thymus and Pineal as Endocrine Organs. H. Lawson, Louisville.—p. 345.
Mumps: Report of Case Treated with Azosulfamide (Neoprontosil). R. E. Smith, Henderson.—p. 348.

Missouri State Medical Assn. Journal, St. Louis

37:333-368 (Aug.) 1940

Acute Suppurative Pleurisy. J. W. Gale, Madison, Wis.—p. 333.
*Pneumoperitoneum in Treatment of Pulmonary Tuberculosis: Report Based on Study of Fifty Cases. L. C. Boisliniere, J. J. Boucek, C. E. Gerson and A. C. Henske, St. Louis.—p. 337.
Pyelonephritis, Chronic Arthritis and Auricular Fibrillation. P. T. Bohan, Kansas City.—p. 342.
The Crippled Child. A. O'Reilly, St. Louis.—p. 346.
Subdural Hematoma, with Special Reference to Its Surgical Treatment, with Analysis of 245 Cases. R. M. Klemme, St. Louis, and R. M. Stuck, Denver.—p. 347.
Horseshoe Kidney Causing Dystocia and Requiring Cesarean Section. L. P. Fitz Gerald, St. Louis.
Treatment of Pertrochanteric Fracture of Femur with a Leg Bolt. S. M. Leydig and T. P. Brookes, St. Louis.—p. 354.
Staphylococcus Aureus Septicemia Treated with Sulfamethylthiazole: Report of Two Cases. J. F. Dowd, Clayton.—p. 358.
Future Vistas in Field of Medicine. F. A. Carmichael, St. Joseph.—p. 361.

Pneumoperitoneum in Pulmonary Tuberculosis.—According to Boisliniere and his collaborators, numerous investigators have reported in the last three decades experiences with pneumoperitoneum in tuberculous enteritis and peritonitis with apparently satisfactory results. Banyai was first to observe the effect of pneumoperitoneum on pulmonary tuberculosis. The authors have employed this method during the last eighteen months in fifty cases of pulmonary tuberculosis at Mount St. Rose Sanatorium. The patient is placed on his back. At a point just to the left of the rectus muscle and midway between the umbilicus and the lower costal border in the left upper quadrant of the abdomen, or at a point 2 inches below and lateral to the umbilicus, the area is swabbed with tincture of iodine and alcohol. An infiltration is made with 0.5 per cent procaine hydrochloride solution through the skin down to the peritoneum, with use of from 3 to 5 cc. of the local anesthetic. An 18 or 19 gage pneumothorax needle is introduced through the anesthetized area into the peritoneal cavity and is connected with the pneumothorax apparatus. The needle is introduced at a slight angle to avoid direct pressure on the viscera. The amount of air usually administered at the first treatment is about 300 cc. Thereafter, at weekly intervals, amounts varying from 500 to 1,500 cc. are given, depending on the extent of the elevation of the diaphragm desired. Occasionally after the initial treatment there is slight discomfort resulting from the displacement of the abdominal viscera. Usually the pain in the shoulder region and sides of the chest disappears within twenty-four hours. The mechanical effects of this procedure are (1) bilateral elevation of the domes of the diaphragm, (2) separation of the liver, spleen and stomach from the diaphragm, (3) diminution in the size of the thoracic cage, favoring a selective collapse of the diseased lung tissue and (4) selective elevation of one of the domes of the diaphragm, especially in a unilateral involvement. The mechanical effects result in the following physiologic changes: (1) lymph stasis which favors fibrous tissue formation, (2) tissue anoxemia in which tubercle bacilli cannot grow, (3) pulmonary congestion which inhibits the growth of the tubercle bacillus and (4) approximately 15 to 35 per cent reduction in the chest capacity. Twenty-six of the fifty patients were hopeless but showed a marked improvement following pneumoperitoneum. The treatment is indicated in all cases in which other methods of treatment have failed or in which such measures are contraindicated by the nature and extent of the involvement. The authors list a number of indications but admit that time alone will determine its ultimate value. They stress that the psychic effect of pneumoperitoneum is valuable, especially in the advanced cases. They do not claim that it will cure these cases, but it will relieve toxemia and prolong life.

Northwest Medicine, Seattle

39:235-274 (July) 1940

Consideration of Protamine Insulin: Management of Surgical Diabetic and Diabetic Coma. I. A. Manville, Portland, Ore.—p. 238.
Urinary Tract Infections: Present Status of Treatment. T. R. Montgomery, Portland, Ore.—p. 243.
Rupture of Urinary Bladder. A. H. Peacock, Seattle.—p. 248.
Induced Gonorrhea. R. A. Nolan, San Diego, Calif.—p. 253.
Hypertension. N. C. Gilbert, Chicago.—p. 255.
Flora and Pollen Surveys of Seattle and Vicinity. J. E. Stroh, Seattle.—p. 258.
Congenital Obstruction of Duodenum: Correction by Duodenojejunostomy. E. B. Potter, Seattle.—p. 261.
Agenesis of Olfactory Tracts: Report of Two Cases. H. N. Roback and M. W. Conway, Medical Lake, Wash.—p. 264.

Oklahoma State Medical Assn. Journal, Oklahoma City

33:1-58 (July) 1940

Aminophyllin, Its Uses and Its Effect on Electrocardiogram. A. McMahon and R. A. Nussbaum, St. Louis.—p. 1.
"Assmann's Foci"—Infraclavicular Infiltration: Form of Early Pulmonary Tuberculosis in Adults. A. J. Ackermann, Oklahoma City.—p. 6.
Relationship of Spina Bifida Occulta to Back Injury. M. A. Connell, Picher.—p. 9.
Use of Sulfapyridine and Allied Drugs in Treatment of Pneumococcic Pneumonia. J. B. Morey, Ada.—p. 11.
Thiamine Chloride: Its Indications and Methods of Use. F. C. Rewerts, Bartlesville.—p. 14.

Psychiatric Quarterly, Utica, N. Y.

14:457-662 (July) 1940. **Partial Index**

Transient Organic Mental Reactions During Shock Therapy of Psychoses: Clinical Study, with Electro-Encephalographic and Psychologic Performance Correlates. P. Polatin, H. Strauss and L. L. Altman, New York.—p. 457.
Prevention of Metrazol Fractures by Beta-Erythroidin Hydrochloride. S. R. Rosen, D. E. Cameron and J. B. Ziegler, Albany, N. Y.—p. 477.
Mode of Action of Ergotamine Tartrate in Psychotic Patients. Esther B. Tietz, Cincinnati.—p. 481.
The Psyche as Object of Hypochondriac Preoccupation. R. C. Hunt, Rochester, N. Y.—p. 490.
Preliminary Report on Results of Treatment of Schizophrenia by Nitrogen Inhalation. B. Lipetz, Albany, N. Y.—p. 496.
Significant Factors in Readjustment of Women Patients with Masculine Tendencies. J. H. Wall, White Plains, N. Y.—p. 504.
Report on 441 Cases Treated with Metrazol. S. Kwalwasser, Orangeburg, N. Y.—p. 527.
Effect of Treatment of Intercurrent Somatic Disease on Psychogenic Disorders. F. M. Criden, Queens Village, N. Y.—p. 547.
Rationale of Specific Therapy for Pneumococcic Pneumonias. J. G. M. Bullowa, New York.—p. 568.
Some Observations on Treatment of Institutional Epileptics with Dilantin. J. J. Doltolo and C. L. Bennett, Poughkeepsie, N. Y.—p. 595.
Response of Various Types of Epilepsy to Dilantin Therapy. H. K. Johnson, Orangeburg, N. Y.—p. 612.
Psychoses Associated with Myxedema: Report of Two Cases. I. N. Wolfson, Poughkeepsie, N. Y.—p. 619.
Psychosomatic Relationships in Ulceromembranous Stomatitis. J. L. Bennett, Queens Village, N. Y.—p. 632.

South Carolina Medical Assn. Journal, Greenville

36:185-210 (July) 1940

Fever. R. H. Timmerman, Batesburg.—p. 185.
Review of 228 Cases of Pneumonia, with Particular Reference to Sulfapyradine Therapy. T. L. Takacy, Greenville.—p. 186.
Heart Pain. O. W. Bethea, New Orleans.—p. 191.

Surgery, St. Louis

8:1-168 (July) 1940

*Therapeutic Use of Antitoxin in Experimental Tetanus. H. B. Shumacker Jr., W. M. Firor and A. Lamont, Baltimore.—p. 1.
Pancreaticohepatic Syndrome: Pancreatic Fibrosis and Fatty Liver. W. H. Cole and J. S. Howe, Chicago.—p. 19.
*Late Phase of Congestive Splenomegaly (Banti's Syndrome) With Hematemesis but Without Cirrhosis of Liver: Further Observations on Etiology of Banti's Syndrome and Effect on Prognosis of Certain Variations in Portal Venous Pattern. L. M. Rousselot, New York.—p. 34.
*Prophylactic Use of Sulfanilamide in Abdominal Surgery. J. S. Lockwood and I. S. Ravdin, Philadelphia.—p. 43.
Repair of Tracheal and Bronchial Defects with Free Fascia Grafts. M. Taffel, New Haven, Conn.—p. 56.
Is Conservative Treatment of Infection or Gangrene in Diabetic Patients Worth While? H. E. Pearse and H. R. Ziegler, Rochester, N. Y.—p. 72.
Gastric Resection with Removal of Fundus in Treatment of Duodenal Ulcer. R. Zollinger, Boston.—p. 79.
Right Colectomy in One Stage. H. G. Bell and R. B. Henley, San Francisco.—p. 94.
Painful Scars. F. E. Kredel, Charleston, S. C.—p. 98.
Experimental Studies in Transplantation of Adrenal Gland. J. E. Dunphy and J. L. Keeley, Boston.—p. 105.
Some Current Problems of Anesthesia. H. K. Beecher, Boston.—p. 125.

Antitoxin in Experimental Tetanus.—Shumacker and his associates present studies on the best mode of administering tetanus antitoxin. They describe six series of experiments which demonstrate that tetanus antitoxin administered intrathecally is superior to that given intravenously in guinea pigs having received more than a lethal dose of tetanus toxin and exhibiting local tetanus, and in dogs poisoned with more than a lethal dose of toxin and showing signs of both local and general tetanus. The authors admit that their experiments do not constitute the first attempt to evaluate the therapeutic effect of intrathecal injections of antitoxin. They offer an explanation for the failure of other workers in demonstrating the superiority of antitoxin administered by intrathecal injection. Their own experiments demonstrate that the superiority of intrathecal injection holds true with general as well as with local tetanus. They feel that tetanus antitoxin given in proper amount intrathecally will be found superior to antitoxin administered intravenously in any animal poisoned with a lethal quantity of tetanus toxin, with evident symptoms of tetanus, and yet before a fatal amount of toxin has been fixed. They believe that this will hold true for any animal, tetanus sensitive or tetanus resistant, including man, and that it will hold true whether the toxin is injected into the body or liberated from tetanus organisms in the body tissue. Certain problems remain to be solved such as whether repeated intrathecal injections are more beneficial than a single one and whether the lumbar subarachnoid route is as efficacious as the cisternal.

Congestive Splenomegaly Without Hepatic Cirrhosis.—According to Rousselot, the usual intrahepatic lesion producing congestive splenomegaly is cirrhosis of the liver. In this report, however, he is concerned with a selected group of fifteen patients all presenting the typical symptoms usually associated with Banti's syndrome and all with gastrointestinal bleeding as a dominant symptom, and yet in no case was there coexistent liver cirrhosis. The nonexistence of hepatic cirrhosis was established by most of the available methods. These procedures included various liver function tests carried out before operation, gross examination of the liver at operation, and liver biopsy on one or more occasion in the same patient. There was evidence not only that cirrhosis was absent at the time of operation but that it did not develop, as established by the subsequent clinical course and further laboratory studies for varying periods up to nineteen years after operation. The etiology of splenomegaly can be explained on a mechanical basis; an extrahepatic obstructive factor was demonstrable in the portal venous system of eight of the fifteen patients examined. This was recognized at the operating table in four instances, and four times it was demonstrable only at autopsy. The failure to discover an obstructive factor in the other seven cases is not necessarily a weakness in the author's hypothesis but is due rather to the technical difficulties involved in an operative examination of the portal venous bed away from the splenic hilus, particularly behind the head of the pancreas. The nature of the extrahepatic lesions responsible for obstruction to splenic blood was thrombosis of the splenic vein, thrombosis at the junction of the splenic with the portal vein, stenosis of the portal vein just below the liver, stenosis of the portal vein above the entrance of the splenic vein, cavernomatous transformation of the portal vein and cavernomatous transformation of the junction of the portal vein and splenic veins. In every instance in which splenic vein pressures were taken at operation, a "portal hypertension" could be determined. The evidence presented contradicts the sequence described by Banti of a primary splenomegaly and a subsequent cirrhosis due to a hypothetical toxic agent. The author stresses the frequency of anomalies in the portal system. In this group of cases of congestive splenomegaly due to extrahepatic obstructive lesions the prognosis and variations in clinical behavior were dependent on two factors: (1) the site of the obstructive lesion and (2) variants in the anatomy of the venous pattern. As far as the author knows, this concept is presented for the first time.

Prophylactic Use of Sulfanilamide in Abdominal Surgery.—Lockwood and Ravdin began in 1938 to resort to sulfanilamide in the treatment of inflammatory and traumatic bowel perforations. Impressed with some of the recoveries, they have introduced prophylactic use of sulfanilamide in all bowel resections. A series of twenty-two consecutive colon resections of various types, sixteen for carcinoma and six for nonmalignant lesions, is presented. The type of operation varied with the location and extent of the lesion and the condition of the patient. Ileocolostomy, employing an open technic, was employed in six instances. In the rest the involved bowel was resected and one or both ends of the resected intestine were brought out as a terminal or a double-barrel colostomy. In no case was there clinical evidence of peritonitis during the postoperative course. One death was due to coronary occlusion on the first postoperative day. This series is small and of doubtful statistical significance. The authors, however, have been encouraged by the results of prophylactic sulfanilamide therapy in the first year of its trial. They present six instances of inflammatory and traumatic perforation of the intestinal tract in which sulfanilamide treatment was used. The recovery of the two patients with local peritonitis associated with sigmoid diverticulitis is perhaps not at all remarkable, but in the other four cases the nature of the lesions found at operation and the immediate condition of the individual patients was such as to lead the authors to believe that the prognosis was extremely grave. Surgeons have been hesitant to employ sulfanilamide and its derivatives in the prevention and treatment of peritonitis of intestinal origin because of a well entrenched belief that sulfanilamide is effective only in infections due to certain cocci. The authors gained the impression that, under special experimental or pathologic conditions which favor drug action, sulfanilamide may have some degree of antibacterial effect against almost all species of pathogenic bacteria. Peritonitis of intestinal origin is a polymicrobic infection, and the bacteria concerned in its production are relatively, but not entirely, resistant to sulfanilamide bacteriostasis. This bacteriostatic effect may become significant in the peritoneal defense against postoperative peritonitis if an adequate concentration of the drug is present, if the number of contaminating organisms is small, if tissue necrosis is minimal and if the usual cellular defense is present. Clinical experience is as yet insufficient to warrant a final conclusion as to the effectiveness of sulfanilamide in the prevention of peritonitis.

West Virginia Medical Journal, Charleston

36:337-392 (Aug.) 1940

Developments in Organized Medicine, 1939-1940. F. V. Langfitt, Clarksburg.—p. 337.
Treatment of Gonorrhea in the Male. D. E. Scott, Lexington, Ky.—p. 341.
Clinical Observations in Treatment of Gonorrhea with Sulfapyridine. C. A. Hoffman, Huntington.—p. 347.
Traumatic Hernia of Diaphragm with Complications: Case Report. L. S. King, Philippi.—p. 352.
Care of the Premature Infant. T. W. Nale, Charleston.—p. 356.
Significance of Electrocardiography in General Practice. S. M. Jacobson, Cumberland, Md.—p. 361.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

52:205-232 (July) 1940

Critical Review of Pigment Research in the Last Hundred Years. E. Meirowsky.—p. 205.
Poikiloderma Atrophicans Vasculare: Case. S. W. Smith.—p. 218.
Kaposi's Varicelliform Eruption: Some Experimental Findings. F. R. Bettley.—p. 222.

British Medical Journal, London

2:39-72 (July 13) 1940

Medical Treatment of Peptic Ulcer. E. Spriggs.—p. 39.
Surgical War Experiences. A. Odelberg.—p. 43.
Rationale of Complete Immobilization in Treatment of Infected Wounds. J. Trueta and J. M. Barnes.—p. 46.
*Transfusion of Fresh and Stored Blood. H. F. Brewer, M. Maizels, J. O. Oliver and Janet Vaughan.—p. 48.
Hypertonic Sodium Sulfate: Practical Applications. J. C. Lyth.—p. 53.

Use of Fresh and Stored Blood in Hemorrhages.—Brewer and his associates sought to determine the relative therapeutic value of fresh blood (stored for less than twenty-four hours) and stored blood (kept from ten to fourteen days) in acute and nonacute hemorrhage and the relative incidence and character of the reactions on the basis of 153 cases (fifty-eight fresh blood, ninety-five stored blood). The transfused blood used was mixed in the ratio of two parts of blood to one part of a solution consisting of 3 per cent dextrose in 0.85 per cent sodium chloride and 1.05 per cent sodium citrate. The investigators were in full accord that stored blood was as valuable as fresh blood in the treatment of acute hemorrhages but were not so certain in nonhemorrhagic involvements. Stored blood in many cases gave a rise in hemoglobin (Haldane's method) as high as that produced by fresh blood. However, on the average, the gain was greater with fresh blood. For purposes of comparison, hemoglobin readings were taken at approximately twenty-four hours, forty-eight hours and after the fifth to the seventh day after transfusion. Differences in blood pressure for the two blood groups showed a remarkable equality; those in pulse rate were very small and could be attributed to chance. Mild reactions, excluding rise of temperature, occurred more commonly after the use of stored blood. Severe rigor was found to be practically identical in the wake of either blood transfusion (4.7 as against 5.4 per cent). In no case was a really serious reaction with jaundice and hemoglobinuria noted or a difference in the rise of temperature after the use of fresh or stored blood in nonacute hemorrhages whether used warm or cold. However, it was found to be advantageous to warm blood to approximately body temperature. The analysis revealed no connection between the amount of blood given and the risk of reactions or between the rate of administration and the risk of reactions. In a total of 153 cases no severe hemolytic reaction occurred nor fatal results attributable to the transfusion. The authors indicate that the subject requires further study.

Glasgow Medical Journal

16:1-34 (July) 1940

*Prognosis in Diabetes in Childhood: Review of Seventy Cases. D. H. Wallace.—p. 1.
Thrombosis of Abdominal Aorta, with Report of Case. J. Ronald and Margaret Leslie.—p. 7.

Prognosis in Diabetes of Childhood.—Wallace points out that since the discovery of insulin the outlook in diabetes has undergone a complete change, especially with regard to children. Whereas in preinsulin days few children lived for more than two years after the onset of the disease, now prospects of life and of a reasonably comfortable and useful existence are greatly enhanced. An analysis is presented of the results of treatment of patients admitted to the Royal Hospital for Sick Children, Yorkhill, since the institution of insulin therapy in 1924. Seventy-seven cases have come under observation. Of this number seventy have been followed up with a view of determining the initial and late results of control and supervision. Eighteen of the seventy have died: four in coma associated with some infection, two of uncomplicated infection, eleven in coma without any other cause and one from prematurity and atresia of the pancreas. The average duration of life in these eighteen cases was 2.3 years. The majority of the deaths occurred within two years of the onset of the disease. The prognosis improves in children who have survived for longer than that period. The mortality rate was higher in those patients who did not attend the outpatient clinic after dismissal from the hospital than in those who did attend. The average duration of the disease in the fifty-two patients who are still alive has been 4.14 years. In these, tolerance has improved in seventeen cases, has diminished in twenty-six and is stationary in nine.

Journal of Laryngology and Otology, London

55:237-268 (May) 1940

Keratosis Pharyngis. G. Swinburne.—p. 237.
The Staging of Malignant Disease: Carcinoma of Esophagus. W. M. Levitt.—p. 251.

Journal of Mental Science, London

86:591-750 (July) 1940

Unilateral Hydrocephalus: Report of Two Cases of Nonobstructive Type. R. M. Stewart.—p. 591.
Physical Types and Their Relations to Psychotic Types. J. I. Cohen.—p. 602.
Follow-Up Study of Hyperkinetic Children. E. Guttmann and Mildred Creak.—p. 624.
Differentiation of Neuroses and Psychoses, with Special Reference to States of Depression and Anxiety. C. H. Rogerson.—p. 632.
Observations on Autonomic Functions During Hypoglycemic Treatment of Schizophrenics. C. S. Parker.—p. 645.
*Convulsion Therapy by Ammonium Chloride. E. C. Dax.—p. 660.
Psychotherapeutic Approach in Schizophrenia. M. Gwendoline Ernst.—p. 668.
Vitamin C in Senile Psychoses: Preliminary Report. P. Berkenau.—p. 675.
Mirror Writing in Normal Adults. J. C. Batt.—p. 680.
Blood Sugar Changes Following Cardiazol Treatment. J. E. O. N. Gillespie.—p. 688.

Convulsion Therapy with Ammonium Chloride.—Dax used pure ammonium chloride, 10 cc. of a 5 per cent solution given as rapidly as possible, to produce convulsions in twenty-four mentally disordered patients. The injections were given twice a week. Sixteen of the patients had received no previous treatment, four had completed a course with metrazol or azoman (3-ethyl-4-cyclohexyl-1, 2, 4-triazol) without success and four received injections during a course which had been commenced with metrazol or azoman. Ten of the sixteen patients had schizophrenia from two to ten years. Of the other six patients, one had involutional melancholia, two had mania with no signs of recovery, one was confused and not improving and the other two were depressed. Of the schizophrenic patients the one acutely affected had thirteen injections of ammonium chloride with some improvement, though she remained impulsive in her actions, hallucinated for hearing and uncertain in conduct. After nine injections of metrazol she recovered and has been discharged. A girl with a previous remission recovered and was discharged after nine ammonium chloride convulsions. Of the remaining eight patients four showed improvement, one had heart failure after five convulsions though making good progress and three were no better and were given other convulsants. The patient with involutional melancholia had twenty fits with improvement and now appears to be recovering. The confused patient had ten injections with little change and is now awaiting discharge after three metrazol convulsions. One of the patients with melancholia had twenty ammonium chloride fits with only moderate improvement. One injection of metrazol was given, but she complained of pain following the fit and a small fracture of a dorsal vertebra was found. The other melancholic patient had thirteen fits with ammonium chloride, resulting in only a slight improvement, but after four injections of metrazol she recovered. One patient with mania showed little improvement with ammonium chloride and has improved on other convulsants. The other mania patient had ten ammonium chloride convulsions and became a little less restless; these were followed by one injection of metrazol, one of azoman and three of ammonium chloride; she then recovered. The four patients who had previously been given convulsion therapy were schizophrenic. Two had fifteen ammonium chloride convulsions without effect. The other two, given sixteen and twenty-eight injections of ammonium chloride respectively, have

shown considerable improvement. Both have been ill for more than three years and previous treatment with metrazol and azoman gave little improvement. Of the four remaining patients only one improved considerably after eleven metrazol injections and was discharged as recovered after a further ten convulsions with ammonium chloride had been given. The author states that the muscular movements following ammonium chloride injections are so slight, in comparison with the convulsions produced by other drugs, that the risks of fracture or dislocation appear negligible provided the staff does not interfere during the fit. The results of ammonium chloride convulsions are not nearly as good as when metrazol or azoman is used; however, the risk of fractures is negligible and the elevation of blood pressure after the fit is comparatively small. It may be found useful in completing courses of treatment after an improvement has been obtained with other drugs. It seems worth trying when metrazol or azoman has failed and it may prove useful for the older, more feeble or bedridden patients.

Lancet, London

2:31-60 (July 13) 1940

*Closed Plaster Treatment of Infected Wounds. G. R. Girdlestone.—p. 31.
*Vincent's Disease Treated with Nicotinic Acid. J. D. King.—p. 32.
Extrapleural Cardio-Omentopexy. A. K. Henry.—p. 35.
Survival of Meningococci on Swabs and Blood Agar. A. W. Downie.—p. 36.
Treatment of Compound Fractures of Leg. G. K. McKee.—p. 38.
Injury to Tympanic Membrane Caused by Explosions: Report of Six Cases. D. H. Craig.—p. 40.

Closed Plaster Treatment of Infected Wounds.—Girdlestone thinks that there is no need to reject enclosure of the wound and immobilization of the soft tissues, because the full ritual is in part contraindicated. 1. In the débridement, the general rule is to excise, as far as practicable, infected tissues and tissues devitalized by bruising or by the impairment of circulation. 2. It is advisable to lay open rather than suture when suturing would involve tension and devitalization of the skin or deep parts. 3. There should be a varying degree of "saucerization," which allows natural retraction of the muscles to the position of equilibrium and involves a laying open for free drainage of all pockets or areas of heavily infected or damaged tissue which cannot properly be excised. For serious destructive wounds the requirements vary from the saucer to the cup; but there are many wounds in which no such formidable exposure of the deep tissues is indicated. Nothing more may be needed than a layer of broad wick laid between the edges of the wound after débridement. 4. The plaster splintage has a dual purpose: (*a*) the restoration of function by keeping the bones, joints and muscles at rest in the chosen position; (*b*) defense against the spread of infection by keeping the cellular infiltration undisturbed in the tissues and lymph channels round the wound. 5. This is favored by a particular technic of enclosure of the wound in that part of the plaster which covers the exposed tissues. It should apply an even gentle pressure similar to that normally exercised by the fascia and the skin. 6. The closed plaster treatment eliminates frequent dressings, which mean either pain or repeated anesthesia for the patient and are both time consuming and expensive. It has been said that after two or three days the closed plaster method is not applicable to a dirty wound because excision is no longer practicable. This is a great mistake, for in the author's opinion no method of treating can compare with closed plaster after saucerization, which may include laying open all heavily infected areas. A wound that will benefit from saucerization and enclosure does not always need excision; indeed, excision is generally contraindicated in the presence of established sepsis. On the other hand a late wound which has been unsuccessfully treated by excision and suture may need the whole ritual. It has been said that for wounds near a joint this method is unsatisfactory on account of resultant stiffness. It is true that when early excision and suture without tension can be undertaken the method need not be applied. But where the wound has involved widespread laceration and devitalization of tissues or where, owing to lapse of time, there is spreading infection, the closed plaster method gives not only relative safety of life and limb but also a better prospect of movement. The method has been decried because a number of wounded men have reached the hospital with wounds doing badly from extensive pressure sores. Probably the surgeons were imperfectly familiar with the method, for he who would apply plaster in war must be skilful in its use or he will be a danger to his patients and bring undue discredit on the method.

Vincent's Disease Treated with Nicotinic Acid.—King directs attention to the possibility of an association between pellagra and Vincent's disease. He was told by Platt that among the natives of Nyasaland an inflammation of the gums was common and that smears showed the organisms typical of Vincent's angina. Since these lesions did not respond to vitamin C or to local treatment with neoarsphenamine it was thought that the gingivitis might be an early manifestation of pellagra, which is common in Nyasaland and therefore might be cured with nicotinic acid. In a case in which cooperation could be obtained, a week's course of nicotinic acid effected cure. Reports on pellagra reveal that stomatitis and glossitis are nearly always present. Indeed the effect of various treatments on these oral manifestations of pellagra has been used as a criterion of their efficacy. Moreover, in typical cases of pellagra fusiform bacilli and Spirochaeta vincenti are commonly found. Four cases of severe Vincent's disease were successfully treated with nicotinic acid by mouth. Inoculation of the author's mouth with infected material from a severely affected patient failed to induce inflammation or ulceration. The organisms grew in abundance for a short time, but they had disappeared three days after the inoculation. A similar experiment on a monkey caused gingivitis, which subsided within ten days without treatment. A study was begun of the excretion of nicotinic acid in the urine of four persons with "normal" gums and of one with Vincent's gingivitis. The patient with Vincent's angina showed an abnormally small amount of nicotinic acid excreted in the urine compared to that of the four people with healthy mouths. A larger number of investigations is necessary before conclusions can be drawn. It is suggested that Vincent's disease may be related to deficient intake or utilization of nicotinic acid and its allied pyridine derivatives of the vitamn B_2 complex. The author's failure to sustain the growth of fusiform bacilli and spirochetes in his mouth and their relatively rapid disappearance from a monkey's mouth suggest that spread of the disease may be determined by some constitutional factor. The experiences of health authorities during the last war, however, makes it still advisable to treat the lesions as infectious.

Medical Journal of Australia, Sydney

1:747-780 (June 1) 1940

Studies in Tuberculosis: I. Incidence of Tuberculosis Infection In and About Sydney, New South Wales, as Shown by Intracutaneous Tuberculin Test. D. Anderson.—p. 747.
Some Aspects of Thyrotoxicosis in New South Wales. N. Wyndham.—p. 756.
Tick Paralysis: Dangerous Disease in Children. D. G. Hamilton.—p. 759.

1:781-814 (June 8) 1940

Studies in Tuberculosis: II. Tuberculosis Infection in Nurses, with Special Reference to Incidence in New South Wales. D. Anderson.—p. 781.
Factors Affecting Vitamin C (Ascorbic Acid) Content of Fruit and Vegetables. Kathleen W. Robinson and R. Courtice.—p. 786.
Technic for Estimation of Gas Tensions in Tissues by Gas Depot Method. E. W. Sibree.—p. 788.
Treatment of Gas Gangrene with Sulfanilamide and Related Compounds: Note. E. Singer.—p. 796.

1:849-884 (June 22) 1940

Further Observations on Incidence of Hemolytic Streptococci in Tonsils. I. Macdonald, R. T. Simmons and E. V. Keogh.—p. 849.
*The Schultz Syndrome (Granulocytopenia), with Special Reference to Its Treatment with Extract of Yellow Bone Marrow. E. B. Drevermann and Hilda J. Gardner.—p. 851.
Treatment of Fractures, with Special Reference to Fracture of Surgical Neck of Humerus. D. Donald.—p. 858.
Studies in Tuberculosis: V. Intensity of Tuberculin Reaction and Its Relationship to Frequency of Radiologically Recognizable Tuberculosis in Apparently Healthy Young Adults. D. Anderson.—p. 861.
Some Physiologic Effects of Heat and Light. E. P. Dark.—p. 863.

The Schultz Syndrome (Granulocytopenia).—Drevermann and Gardner report six cases of Schultz syndrome, granulocytopenia, and four cases of other blood dyscrasias (myeloid, lymphatic and monocytic leukemia and aplastic

anemia). Some patients recover without any treatment other than cessation of the causal drug, but the condition must be treated as a medical emergency because death may follow the onset and therefore the withholding of any form of recommended treatment is not justified. Treatment includes roentgen therapy, nucleic acid, pentnucleotide and liver extract. Roentgen therapy is regarded as useless. More recently, extract of yellow bone marrow has been used. The authors have followed the method of Zichis for the preparation of the extract but have carried the saponification further and have obtained a product similar in appearance to that of Marberg and Wiles. Arrest in development of the polymorphonuclear cells may take place at different stages and a special substance may be required for each, and since it is not possible to distinguish clinically the stage at which arrest has occurred the authors suggest that pentnucleotide and yellow bone marrow extract be given simultaneously to all patients. Each may play a part in the maturation of the polymorphonuclear leukocytes. In some cases liver extract may prove to be of value. Two recoveries have been had with marrow extract. In another case the blood picture returned to normal; but, despite this, death occurred. The other three patients failed to respond when treated with marrow extract and/or pentnucleotide. Therefore marrow extract is not specific in all cases and should be used in conjunction with pentnucleotide. Marrow extract was of no value in the other four blood dyscrasias. All four patients died.

Dermatologica, Basel

81:281-344 (May) 1940

*Oral Treatment of Gonorrhea with Sulfapyridine. B. Meier.—p. 281.
Fatal Case of Syphilis with Dermatitis and Icterus Treated with Arsphenamine and Bismuth Compounds. M. Winkler.—p. 297.
Observations in Treatment of Gonorrhea in Men with Sulfanilylaminopyridine. G. von Dóczy.—p. 310.
Seborrhea, Common Acne, Conglobate Acne, Acne Rosacea, Diseases of the Sweat Glands, Hair, Nail and Pigment Disturbances. A. Ackermann.—p. 316.
Dermatoses Mainly from External Causes. W. Lutz.—p. 330.

Oral Treatment of Gonorrhea with Sulfapyridine.—Meier reports on oral treatment of 173 cases of gonorrhea with sulfapyridine. Most patients received one course of treatment of thirty tablets in decreasing doses within six days. Where the first course of treatment did not bring about a complete cure, a second course of thirty-six tablets was given from ten to fourteen days later. Local treatment was also administered. Ninety-five and nine tenths per cent of the patients were cured, with men reacting slightly better to the drug. Sulfapyridine was effective in new as well as in chronic cases and satisfactory results were obtained in complicated cases. There were slight reactions in forty-five cases and cutaneous rashes of brief duration in two instances. A survey of the literature reveals that on the average 86.7 per cent of 1,586 cases of gonorrhea were cured with sulfapyridine. Higher dosage with local treatment was observed to produce better results than lower dosage without local treatment.

Semana Medica, Buenos Aires

47:57-112 (July 11) 1940. **Partial Index**

*Cancer of Testes: Present Status of Knowledge. R. Bernardi.—p. 57.
Anorectal Fistulas: Classification. J. A. Garat.—p. 97.

Cancer of Testes.—Bernardi discusses the diagnosis, prognosis and treatment of cancer of the testes and presents a review of the literature and results of his experience in thirty-two cases. The incidence of testicular cancer is from 0.5 to 2 per cent as compared with cancer of other structures. The incidence of cancer in ectopic testes not operated on is from 0.5 to 2 per cent as frequent as that of cancer of the normal testes. Cancer of an ectopic testis which has been brought down into the scrotum by surgical intervention is more common than it is in the ectopic nontreated testis. Testicular cancer develops without giving rise to early symptoms, with more or less acute increase in the volume of the organ and a change in its consistency. Chevassu's palpation of the epididymis and certain hormonal tests are the most reliable diagnostic procedures. Hormonal reactions give positive results between the first and third month of the appearance of local symptoms and in recurrence or the appearance of metastases. The more malignant the type of tumor, the higher the figures of the reaction, the highest figure being obtained in chorionepithelioma. Negative results of hormonal reactions suggest the absence of a testicular tumor or the presence of a teratoma. Prognosis depends on the nature and histologic structure of the tumor, the absence or presence of metastases, their seat and extent and especially on the early diagnosis and the opportunity of an early castration preceded and followed by roentgen irradiation. The author advises castration even in the presence of a tumor sensitive to irradiation and systematic roentgen therapy before and after castration with preoperative irradiation of the supraclavicular and lumbothoracic lymphatic chain and postoperative irradiation of the mediastinal and left supraclavicular regions. The course of the disease after castration and roentgen therapy is periodically controlled by repeated hormonal tests, positive results indicating the advisability of further roentgen therapy. This treatment was practiced in ten of the thirty-two cases. Satisfactory results were obtained in the absence of metastases. In cases of lumbo-aortic metastases irradiation diminished their size and alleviated the pain.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

80:1621-1668 (July 2) 1940

*Determination of Nicotinic Acid in Patients with Nutritional Edema in Central Java. A. G. van Veen and R. S. Dhanoedibroto.—p. 1622.
Further Observations on "Sweet Potato Louse" from Suriname with Remarks on Reaction of Human Skin to Presence of Mite Larvae. P. H. van Thiel and H. van Ommeren.—p. 1638.
Local Cutaneous Allergy: Diphtheria of Skin. D. P. R. Keizer.—p. 1655.
Several Unusual Lesions of External Male Genitalia. J. H. Maasland.—p. 1659.

Determination of Nicotinic Acid in Nutritional Edema.—According to van Veen and Dhanoedibroto, nutritional edema occurred rather frequently in central Java during 1939. Successive crop failures were the cause. It is noteworthy that, although the nutrition was deficient in many respects, only edema and sometimes slight pellagra-like symptoms but no other deficiency symptoms were observed. Diet surveys and medical examinations were made. A number of analyses were done on the vitamin A, vitamin B_1, nicotinic acid and protein contents of the blood of patients with nutritional edema and of the members of their families. The blood of patients with nutritional edema, some of whom showed pellagra-like symptoms, was analyzed for the concentration of nicotinic acid when the patients entered the hospital. Because the nutrition had been deficient for a long time and in practically every respect, it was to be foreseen that no pure and uniform deficiency syndromes would appear. Moreover, these syndromes were blurred by ancylostomiasis, which is a frequent concomitant of poor nutrition, and sometimes by various other diseases (malaria, dysenteries). In some cases a low content of nicotinic acid was found in the urine but since it was impossible to get the twenty-four hour volumes or to learn whether anuresis or diuresis was present when the patients entered the hospital these determinations do not have great value. More attention was paid to the determination of the nicotinic acid level in the blood. Low nicotinic acid levels frequently occurred in the blood of the patients with edema. These low values were, however, not to be directly connected with the slight pellagra-like symptoms or with the so-called porphyrin reaction of Beck-Ellinger-Spies. On the other hand the authors found a rather close connection with the blood cell volume (as determined by the hematocrit) in the sense that a low nicotinic acid level was almost always attended by a low cell volume, which was of frequent occurrence in these chronically underfed, mostly anemic patients with edema. This connection between nicotinic acid content and hematocrit value depends on the fact that nicotinic acid does not occur in the blood serum. With a normal cell volume a normal nicotinic acid level was usually found, but at the same time pellagra-like dermal symptoms would sometimes occur. It is likely not only that the food (chiefly Indian corn) of the patients with nutritional edema is deficient in nicotinic acid but also that the conveying capacity of the blood for nicotinic acid has been reduced by the low cell volume. It would be interesting to know whether low cell values play a part also in the nicotinic acid supply of patients with classic pellagra.